Journal OF THE AMERICAN DIETETIC ASSOCIATION

VOL. 22, NO. 4 APRIL 1946

Hospital Library Hospital Library

Problems of Nutrition in Mexico
Maria Elena Ramírez

Nutritional Status of Economically Poor Families Fed in a Government-Operated Dining Room in Mexico City
José Calvo, M.D., Gloria Serrano, M.D., Rafael Segura Millan, M.D., Francisco de P. Miranda, M.D., and Richmond K. Anderson, M.D.

Activity as it Affects the Basal Metabolism of College Women
Charlotte M. Young and Eva G. Donelson

Variations in the Basal Metabolism of Midwestern College Women
Martha S. Pittman, Virginia Baxter, Edith Dawley Stokely, Margaret A. Ohlson, Charlotte Herman, Eva Donelson, Doris Grambow, Hughina McKay, Mary Brown Patton, and Williamina Armstrong Himwich

Effect of Guava Juice and Papaya on the Acidity of the Urine
Winifred Ross and Eva Hartzler

The Antirachitic Value of Winter and Summer Milk Produced in Hawaii
Carey D. Miller

Riboflavin and Thiamin Loss in Cooking Eggs
Olof E. Stamberg and Charlie F. Petersen

Composition and Nutritive Value of Mushroom Protein
William H. Fitzpatrick, William B. Esselen, Jr., and Edith Weir

A.D.A. Annual Meeting, Cincinnati, October 14–18, 1946

Published by THE AMERICAN DIETETIC ASSOCIATION

There Is Only ONE *heavy-duty* Shortening

A PRODUCT OF

Shortening SHQ Headquarters

WESSON OIL & SNOWDRIFT SALES CO.

NEW YORK • CHICAGO • SAVANNAH • NEW ORLEANS • SAN FRANCISCO • MEMPHIS • HOUSTON

Problems of Nutrition in Mexico[1]

MARIA ELENA RAMÍREZ

Jefe Servicio de Nutrición, Hospital del Niño, Calle Del Dr. Marquez, Mexico

THIS brief study of the nutritional problems of the Mexican people—the principal causes of malnutrition and the plans which should be adopted to attain the standards set by other progressive countries—must, of necessity, include a sketch of Mexico's food history.

The varied climate and diverse topography have given our country certain advantages in respect to food production. Mountains, tablelands, tropical lowlands, deserts, and coastal regions provide a broad range of temperature. All this permits a corresponding diversity of food such as wild game from woods, marsh, and field; fruits, vegetables, cocoa, coffee, and cattle from tropical lowlands; corn, beans, chile, goats, and sheep from the cooler highlands.

Corn, beans, and chile formed the basic diet of the aboriginal races for more than two thousand years. To this have gradually been added fruits, vegetables, new types of grains, nuts, eggs, fish, and game indigenous to the regions and countries from which successive populations emigrated to Mexico.

Long after the Spanish invasion by Hernán Cortés in the early sixteenth century, daring explorers continued to arrive from faraway places in small sailing vessels that had weathered long and dangerous voyages. They came from Europe, Asia, and Africa, bringing with them the typical products of those distant lands—cattle, chickens, pigs, wheat, olives, citrus fruits, and vegetables—and on their return trips they took cocoa, maize, chicle, sweet potatoes, vanilla, turkeys, and all manner of tropical fruits.

This interchange of edibles caused variations in the diet of Mexican people. From China, for example, rice had been introduced, which promptly became an indispensable part of the Mexican diet and remains so to this day. The Spanish conquistadors likewise left their permanent mark. In the kitchen, for instance, they went further than merely augmenting the menu with their favorite foods; they actually changed the eating habits of the native population by the initiation of Spanish culinary techniques. Since they had come to stay they mingled their blood as well as their tastes in food, thus developing simultaneously a hybrid race and a hybrid cuisine. Whereas the natives had little by little acquired a taste for vegetables, the Spaniards looked upon this item of the diet, including corn, as fit only for poor Indians; they, in contrast, considered meat and eggs as the only proper food and any elevation in income or social position soon came to mean a proportionate increase in the consumption of meat, eggs, and cheese.

[1] Translated from the Spanish by Anne Radoff Biederman. Received for publication July 30, 1945.

CAUSES OF MALNUTRITION IN MEXICO

Notwithstanding Mexico's high degree of soil fertility in certain regions and its climatic adaptability which permitted the imported seeds, plants, and animals to flourish in their new habitat, the paradoxical fact remains that the percentage of malnutrition arose in direct ratio. Why? The chief obstacle to a happier state of affairs was the semi-feudal agricultural system which prevailed from the time of the Spanish conquest to the agrarian revolution of 1910. While statistics showed one kilometer of land per person, all the land belonged to a few wealthy landowners, some of whom possessed huge estates as large in area as France or Belgium. It was to their advantage to limit their crops to those requiring the least care and attention, such as maize, beans, and chile. Nor did these owners trouble to utilize scientific methods or modern machinery since the peons could work as cheaply and as effectively without the machinery which called for the investment of money.

A further obstacle toward the production of a greater variety of crops resulted from the fact that enormous stretches of land were planted in maguey, the greater cactus, which grows in poor soil and requires no irrigation or cultivation. Maguey, the century plant, yields the sap called aguamiel (honey water) which when fermented becomes pulque, a five per cent alcoholic beverage that brings a handsome compensation to the grower and inevitable degeneration to the immoderate consumer. Its

questionable food properties are more than nullified by its tendency to make hopeless addicts out of a poor, unhappy people.

Another detriment to proper nutrition stems from the exclusive raising of henequen, also a species of century plant used in making fiber and rope, in so rich and fruitful a region as the tropical peninsula of Yucatán, called the "land of deer and pheasant," because of its abundance of wild turkey and other game. Here the population, descendants of the great and cultured Mayan race, suffered enslavement at the hands of the conquistadors to facilitate the production of henequen. These ill-nourished and hard-worked slaves did not obtain their freedom until 1915 when General Salvador Alvarado abolished slavery and inaugurated a totally new and beneficent regime under which their miserable diet was corrected by the addition of fruits, grains, and vegetables.

Another problem in Mexico's long history of malnutrition arises from the fact that the backward methods of farming practised by the average individual yielded so meager a livelihood that the ambitious young people tended to leave the land and try their luck in the towns and cities. Thus the farms were drained of workers; the nation was prevented from having its rightful share of raw products. Scientific education, by offering a brighter future in agriculture, could eliminate this dangerous exodus.

Still another barrier has operated to deprive the Mexican nation, as a whole, of correct diet—transportation difficulties. Great mountain chains, extending from the Sierra Madre (part of the Rocky Mountain system) to the eastern seaboard, isolate and make inaccessible vast and rich agricultural zones. Their chief products, tropical fruits, can be brought into more densely populated areas only on muleback, a slow and precarious process. Mexico, unluckily, possesses no navigable rivers to cut the much needed pathways through its tortuous highlands.

LEADING FOOD PRODUCTS

So much for the historical, agricultural, economic, and transportation difficulties which have beset Mexico and denied it proper nourishment in a land of potential plenty. Let us examine the use which has been made of those products that do prevail, and how they have helped or failed to furnish the necessary sustenance.

Maize, first on the list, though a native of the Americas, has achieved prime importance only in Mexico as the chief source of food. Moreover, the Indians have developed a most unique way of preparing it. The dry kernels of corn are softened by a covering of lime and water, heated to boiling point, allowed to stand for eight hours, then washed in several waters, ground and kneaded into a putty-like dough. This masa is the base of practically all the food eaten by the poor in Mexico and appears in every course, every day in the year. Masa forms the base of gruels and soups; it constitutes the only bread available to the very poor—the unleavened pancakes called *tortillas*; it provides the main dishes such as enchiladas, *chalupas*, *tacos*, etc., it is also the chief ingredient in the popular gruel-like beverage, *atole*.

This limited diet, though possessed of calcium, is far from sufficient in other nutrients and should be supplemented; but only those with higher incomes than those of the Indians at large can afford to purchase the meat, fish, grains, and fruits necessary to do this.

Another obstacle toward efficient feeding of our nation is found in the primitive methods of food preservation. Meat and fish are still cured in the old way, with salt. Refrigeration as a means of conserving meat is not yet generally used. Canneries, too, are uncommon, which means that only fruits and vegetables which lend themselves readily to dehydration by being sun-dried are saved. Other surplus seasonal crops are frequently wasted.

Thus we have added one more link in the long chain of difficulties that seem irremediable. Yet, insuperable as they may appear, courageous measures have already been initiated to overcome them.

OFFICIAL EFFORTS TO COMBAT MALNUTRITION

First, the vital land reforms created by the 1910 revolution will go far toward eliminating the evils inflicted upon the people by the conscienceless *hacendados*. Division of the land into small parcels or *ejidos* for individual and village cooperative cultivation will put an end to the exclusive and extensive one-crop production of pulque and henequen for the sole profit of a few and at the terrible cost of a nation's food. The system of *ejidos* permits each man to raise his small truck garden for personal necessities and thus protect himself against actual hunger. The communal *ejidal* dotations provide acreage and facilities for the country's large-scale crops.

Something is also being done for the farmers who will work the lands recovered from the haciendas and reclaimed from vast and idle acreage. They will be given the advantage of an education in agronomy. The increase of rural and agricultural schools will not only improve present conditions but will lure the youths back to the soil by the offer of a healthier, more secure living than they could earn in the more congested areas. In these schools social workers, nurses, physicians, and experts in food economy demonstrate new foodstuffs and new methods of preparing the old.

With regard to transportation, many fine highways and subsidiary roads now connect agricultural regions with the cities, thus expediting the movement of raw products to the consumption centers. Construc-

tion of more railroads, too, has helped to ease the supply situation.

Better means of food conservation will result through canneries now being developed to take care of the meat, fish, fruits, and vegetables now being produced in excess quantities in favorable zones. With improved transportation facilities these preserved or canned products can be shipped to the less favored localities.

This brings us back to the economic capacity of the people to buy these prepared comestibles. Until recently low wages prevented most of the populace from purchasing them. The antidote for this state of affairs arrived with the establishment of a minimum wage scale, social security, and numerous other government regulations aimed to raise the standard of living.

During the war there has been an acute crisis in food supplies. Huge quantities of cattle, sugar, fruit, and petroleum (the chief fuel used in cooking) left Mexico daily to supply war needs of the United States as part of our lend-lease and good neighbor policy. Furthermore, thousands of our farmers and laborers left their lands and workshops to seek more lucrative employment in the United States.

But the exportation of food and *braceros* still does not explain the whole cause of our present scarcity of food and the accompanying incredible rise of prices which has so destructively offset all the wage legislation of recent years. Unscrupulous hoarding and manipulation of prices by wholesale dealers in these commodities have contributed to the food crisis.

Rural organizations, labor unions, small businessmen in syndicates and associations such as the Confederation of Latin American Workers, the *Sector Popular* made up of peddlers and artisans, have all fought grimly for the freezing of essentials with price ceiling wherever possible. Their reward has come in the creation of national distributing and regulating services composed of government representatives in agriculture, industry, commerce, and labor unions. This National Distributing and Regulating Organization has established 800 *sotres* where food is sold at popular prices; it has also distributed products free to institutions, public dining rooms, and wherever conditions demand it. It controls wheat, corn, rice, lard, oil, salt, canned goods, fish, milk, and Argentine corned beef. The Department of National Defense has collaborated to supplement railroad transportation of these essentials by the use of privately owned trucks available through the voluntary cooperation of owners.

The Department of Public Health and Welfare sees to the distribution of sterilized milk for infants, and operates dining rooms for families and students where well-balanced and palatable meals are supplied at a nominal cost. Women's voluntary committees and day nurseries serve 5000 breakfasts to preschool children. Prenatal and infant clinics offer practical instruction in food preparation and diet to expectant mothers. Individual and collective courses in nutrition, food management, and diet are available and compulsory for rural physicians, nurses, social workers, mothers, and managers of institutions.

Around 100,000 dependents in schools, institutions, hospitals, and day nurseries profit from the adequate diets worked out for them by expert medical nutritionists in the technical division of the Department of Public Health and Welfare which, in addition, has its own bakery where bread is prepared from whole wheat and distributed to institutions, and its own plant for preparing infant formulas. It is now inaugurating an intensive program of education for the betterment of the nutritional status of the people.

Studies of city and rural groups of people living in poor agricultural districts and infertile areas of Mexico are centered chiefly on the subject of malnutrition. Surveys are in progress to determine better methods of growing and producing the foods necessary for a well-rounded diet, such as milk, fruits, vegetables, and meat.

IMPROVING VEGETABLE PRODUCTION

The production of vegetables needs special mention. These come almost entirely from the picturesque floating gardens of Xochimilco and include celery, carrots, turnips, radishes, beets, okra, cabbage, lettuce, and many others.

Many greens native to Mexico, agreeable to the palate and of considerable food value (though some still remain to be analyzed), are: *romeritos nopalitos*, tender cactus leaves; *verdolagas*, really a tropical flower; *pemuches*, a green similar to spinach; *huautzoncles*; *calabaza* (squash); and wild potatoes. These, however, do not predominate on the tables of the general public, and are less popular than tomatoes, both green and red (*jitomates*); onions; *chayotes*, a spineless cactus-like fruit which grows on vines and is now extensively cultivated in California; *chilacayotes*, very similar to the pumpkin of the United States; also chard, lettuce, radishes, cabbage, cress, spinach, carrots, turnips, peas, potatoes, and *camotes* (sweet potatoes).

All of the just-mentioned vegetables, however, if cultivated on a large scale would immeasurably benefit the general alimentation of the country. In order to further the use of these vegetables, rural school grounds should be converted into truck gardens and the pupils educated in horticulture. Such a program would not only supply the much needed fresh greens and serve to train farmers for the future, but would eliminate to a marked degree the malnutrition which causes so many deaths in Mexico. The table of mortality records on the following page is from the Department of Vital Statistics.

	1938	1939	1940	1941	1942
Avitaminosis:					
Beriberi	0	15	1	2	2
Pellagra (Yucatan)	316	313	326	378	485
Rickets	431	391	128	698	270
Scurvy					
Infantile (Barlow's disease)	6	9	13	9	19
Other forms	7	69	7	7	10
Other forms of avitaminosis	0		290	411	1239

SUMMARY

Mexico's problems of today with regard to national nutrition will diminish or disappear when agricultural techniques improve, when intense cultivation of fruits and vegetables replaces one-crop plantations, when the minimum wages and prices of necessities balance, when new food industries such as dehydration, canning, freezing, etc., are promoted, and when there is a proper and constant dissemination of the basic principles of nutrition and collective feeding. All this will need to be supplemented by work in laboratories equipped with food chemists to direct experimental research in the field of nutrition.

Such a program requires indefatigable effort and labor, and sufficient funds so that the pitifully small number of specialists engaged in this fight for scientific nutrition may be supplemented. But only with wholehearted national cooperation can we hope to overcome all the problems which keep Mexico from being one of the richest countries—in raw products, in industries, in money, and in the general health level of its population.

THE OXFORD DIETITIANS' CONFERENCE AND AFTER

A world war seems to have been necessary to bring together so many British, Dominion, and American dietitians on the American soil of the 91st U. S. Army General Hospital at Oxford. . . .The barriers of country and climate disappeared, and we enjoyed the variety of accents used in discussing problems which belong to us all. Occasionally we may have needed a glossary to translate such awkward measures as English pints into American ones, but the language of science and the work of dietitians are the same the world over—how to use food in securing and maintaining good health. . . .The two days which dietitians spent in conference at Oxford have been of so much value in thrashing out their common problems, that some way for English-speaking dietitians to work together should be found. Just before the war discussions were begun between the British Dietetic Association and the English Speaking Union about a possible scheme for exchanging dietitians, similar to that for teachers organized by the Union. Could not this scheme be reviewed?

British dietitians are clear as to what they hope to learn in America, working in modern and highly organized dietary departments, seeing American methods of nutrition teaching and the research in nutrition carried out in American laboratories. They know they will learn from inside the ways of life in another country, gaining knowledge for themselves, and adding to the numbers of those, now needed more than ever, who through understanding promote friendship with people of other nations.

What can we offer in return? After six years of food problems, differing widely from those which the war has brought to America, we have learned how to ration and distribute food so as to have the minimum of imports, of transport, and also of complaints from consumers. . . .In all this, British dietitians have done their share, and Americans will be able to see how our huge dietary experiment has succeeded. War has also brought problems in large-scale catering for practical solution, the creation of factory canteens and British Restaurants, the great increase in the number of school meals, milk in schools. . . .

If English-speaking dietitians could organize an exchange for say six months, the value professionally as well as in mutual understanding would be great. Together, dietitians would be able to discover, now that the "fighting war" is over, the best ways of using food in the never-ending struggle against want and disease—the arch enemies of all peoples.—*From an article by Margery Abrahams, in the Autumn 1945 News Letter of the British Dietetic Association.*

Nutritional Status of Economically Poor Families Fed in a Government-Operated Dining Room in Mexico City[1]

JOSÉ CALVO, M.D., GLORIA SERRANO, M.D., RAFAEL SEGURA MILLAN, M.D., FRANCISCO de P. MIRANDA, M.D., and RICHMOND K. ANDERSON, M.D.

THIS report deals with a study of the nutritional status of a group of families before admission to, and after eating for a considerable period at the Comedor Familiar Numero 1 in Mexico City. This family dining room which opened in 1941 is the first of several projected by the Mexican Government and represents an interesting and in many respects unique experiment in group feeding for the purpose of improving nutritional status. These dining rooms are intended for the employed worker whose income lies below the minimum considered necessary for decent living and presumably therefore below that required to feed his family adequately. A wide range of social and occupational groups is included, from manual laborers to white collar workers and even some government employees and professional people. While the income of many of these might be sufficient for a small family it is inadequate when the family is large.

Each family is investigated by the Social Service Department prior to admission to the group, in order to determine the need for such assistance. Each individual pays for his meals according to his family's income, from a maximum of 3 pesos[2] per person per week for a family whose income is 35 pesos per capita per month (persons with higher incomes are not admitted), to a minimum of 1.80 pesos per week for those whose income per month is 15 pesos per person.

The Comedor Familiar Numero 1 is equipped to feed 1250 persons 6 days each week, not including Sundays and certain holidays. The service is cafeteria-style, but an effort is made to preserve the family group. Only families with two or more children under 16 years of age are admitted, and members of each family are expected to eat together at a certain table. Since there are more applicants than can be admitted, families may not use the dining room indefinitely; the maximum period, unless the circumstances are exceptional, is two years.

In addition to food, the plan offers certain social and hygienic facilities. These include medical and dental services, and some dietary and health education. An instance of the latter is that all persons are urged to wash their hands before each meal and brush their teeth afterward.

Racially, the persons admitted to the dining room are chiefly *mestizos* (of mixed blood). They are probably predominantly of Indian stock but often show marked evidences of white ancestry.

A second *comedor*, equipped to feed 1600 persons, will be operating in the very near future. This institution will also provide offices and laboratory and clinical facilities for the National Institute of Nutrition of Mexico.

The purpose of this study was to examine the nutritional status of an economically poor group in Mexico City and to test whether by our present methods any definite improvement could be demonstrated after an extended period on a presumably good diet.

METHODS

The methods used were those employed previously in nutrition studies in Mexico (1, 2, 3). Diet records of the families prior to admission to the dining room were obtained by daily visits to the homes at the time the main meal was being prepared. Approximately one fourth of the records were made on a 7-day basis, the rest on a 3-day basis. The agree-

[1] The studies presented in this paper were carried out under the cooperative auspices and support of the National Institute of Health of Mexico and the International Health Division of The Rockefeller Foundation. Received for publication January 28, 1946.

[2] The exchange value of a peso at the time of this study was approximately 20 cents in United States currency.

ment between the results obtained by these two methods was good. Actual weights and volumes were determined. The consumption by individuals was recorded on the basis of household measures or in terms of portions of each dish eaten by each person. This record serves as a basis for comparison with the diet after admission to the dining room. No attempt was made to determine each individual's intake after entry, but it was possible to calculate the average diet from typical menus and from the over-all records of food purchases and waste.

The tables used in the dietary calculations are based to a large extent on recent analyses of Mexican foods (4). Although more analytical data on these foods are needed before calculations of dietary intakes may be regarded with confidence, we believe the chance for error is less than when calculations are based on data from other countries. Since the same tables were used for the diets prior to and after admission to the dining room, comparisons between them should be valid.

Between July 1943 and February 1945, 481 persons were examined prior to admission to the dining room; 222 of these were re-examined after being fed there for a period of 8 to 16 months, the average time being 13.2 months, with a standard deviation of 2.0 months. For each individual, a careful medical history was taken and a thorough physical examination was made, special attention being directed to possible symptoms and signs of deficiency disease. Slit lamp examinations of cornea, bulbar conjunctiva, gums, and tongue were included. For the laboratory examination approximately 20 cc. of blood was drawn from each individual, with the exception of small children, usually those under 2 years of age. Approximately 4 cc. of the blood was oxalated with a mixture of potassium and ammonium oxalates (5) for hematologic examination. The remainder was used to determine total serum proteins and albumins (6), serum carotene and vitamin A (7), and ascorbic acid (8).

FINDINGS

The average dietary intakes of 413 persons before eating in the dining room are compared (Table 1) with the National Research Council's recommendations for persons of similar age and sex. The calculated values of these diets are presented in detail since they probably approach the minimal for residents of Mexico City, exclusive of the miserably poor and destitute. The diets are poorer, both qualitatively and quantitatively, than those encountered in a previous study of a general population group in Mexico City (1), even if allowance is made for some improvement in the values occasioned by the use of food tables based on analyses of Mexican foods (3, 4). This is to be expected, however, for these people, after social service investigation, were judged to have funds well below the minimum necessary to purchase adequate amounts of food for themselves.

The caloric intakes are low, judged by the recommended standards, and are below those found in the previous study in Mexico City (1). They are higher, however, than the intakes found for Negroes in several studies in the United States (9–11), and approximately equivalent to the values found for Otomi Indians in the Mezquital valley of Mexico (2). The average ratio of total dietary calories to basal calories allows a 50 per cent margin for activity, but those for adolescents and adult males in the group here considered may be below the minimum. The diet was high in carbohydrate (70 per cent) and low in fat (17 per cent), which appears to be the pattern of the majority of the diets of the humbler classes in Mexico (1–3, 12).

The protein intake, averaging 89 per cent of that recommended, would be adequate provided the biological value were good; but as is the case in most Mexican diets, beans and corn were the major sources of protein, and only 18 per cent of the total was of animal origin. The vegetable proteins of beans and corn, however, provided the germ is included as it is in *tortillas*, have a relatively high biological value. Furthermore, it is likely that the amino acid composition of a combination of these proteins, supplemented by even a small amount of animal protein, has a higher biological value than its individual components. It therefore seems doubtful whether much protein deficiency existed in this group.

The vitamin A intake averaged approximately two thirds of that recommended and was obtained chiefly from vegetable sources. The vitamin C intake was about a third that recommended, and was the lowest we have encountered in nutrition studies in Mexico.

Of the vitamin B complex, the thiamin intake was good, while intakes of niacin and riboflavin were both low. This conforms with the dietary pattern observed in several other nutrition studies in Mexico (2–4). The thiamin intake lies well above that often recommended (0.5 to 0.6 mg./1000 calories (13)) while the ratio for riboflavin intake appears borderline (14). Among the minerals, the iron intake was good, but that of calcium, low. In the usual Mexican diet calcium is derived almost entirely from *tortillas*, and their content undoubtedly varies considerably with the preparation methods, depending particularly on the amounts of lime used (15).

Measuring the vitamin D intake did not appear worthwhile, since the average Mexican, particularly among the poorer classes, is exposed to bright sunlight a good part of the day. Clinically, no rickets was discovered. Alkaline serum phosphatase determinations were made on 52 children under 5 years of age (16). The two highest values were 25.2 and 15.5 units, the rest lying within normal limits. Rickets is rare and should be nonexistent in this

region of Mexico, but occasionally is seen in children whose mothers, believing sun is harmful to babies, prevent their exposure to it as much as possible.

Table 2 presents a comparison of the average diet in the *comedor* with the home diet and with the National Research Council's recommended allowances. The values in the second line were calculated from a record of total food purchased, proper deductions being made (found by measurement) for kitchen waste. Purchases for an entire month in each of the four seasons of the year were included in order to allow for seasonal variations. Those in the third line were calculated from a set of menus used as guides in planning the meals, the actual menus varying with the foods available. It will be seen that this diet agrees reasonably well with that calculated from purchase records. All values equal or exceed those of the recommended allowances. It should be stated that these diets were planned before analytical data were available for many important Mexican foods, particularly with regard to the vitamins, so it was difficult to work out a diet accurately.

A few meals were analyzed chemically for vitamins, but they were too few in number to permit definite conclusions. The determined values for vitamins A and C were considerably lower than those obtained by analysis of the menus, due possibly to cooking losses. Even so, the determined values appear to be adequate.

TABLE 1

Dietary intakes prior to admission to the comedor

AGE (*yr.*)	1-9	10-15	MALES, 16 YR. AND OVER	FEMALES, 16 YR. AND OVER	ENTIRE GROUP
Number persons	149	106	65	93	413
Total calories	1,485 ± 25*	1,658 ± 35	1,888 ± 64	1,868 ± 43	1,679 ± 21
Percentage of recommended amount	91	62	60	75	75
Total cal./basal cal	1.74	1.30	1.33	1.47	1.50
Total protein (*gm.*)	49.4 ± 1.1	53.7 ± 1.2	62.4 ± 2.1	62.3 ± 1.6	55.5 ± .75
Percentage of recommended amount	97	71	84	99	89
Vitamin A (*I.U.*)	2,454 ± 119	2,285 ± 138	2,917 ± 234	2,897 ± 172	2,583 ± 78
Percentage of recommended amount	90	48	56	58	66
Vitamin C (*mg.*)	21.7 ± 1.1	19.9 ± 1.3	25.0 ± 1.8	23.6 ± 1.4	22.2 ± .68
Percentage of recommended amount	44	25	32	33	35
Thiamin (*mg.*)	1.15 ± .042	1.22 ± .045	1.56 ± .084	1.49 ± .079	1.31 ± .029
Percentage of recommended amount	14	95	101	124	118
Mg. thiamin/100.0 cal	.77	.74	.83	.80	.78
Riboflavin (*mgr*)	.74 ± .030	.76 ± .026	.80 ± .045	.78 ± .030	.76 ± .016
Percentage of ecommended amount	61	40	38	48	49
Mg. riboflavin/1000 cal	.50	.46	.42	.42	.45
Niacin (*mg.*)	5.2 ± .15	5.8 ± .17	7.1 ± .29	6.7 ± .23	6.0 ± .10
Percentage of recommended amount	63	45	46	56	54
Iron (*mg.*)	9.7 ± .28	11.0 ± .26	13.5 ± .52	12.9 ± .40	11.4 ± .19
Percentage of recommended amount	114	83	108	103	103
Calcium (*gm.*)	.54 ± .018	.56 ± .017	.65 ± .029	.66 ± .022	.59 ± .011
Percentage of recommended amount	54	43	72	82	60
Phosphorus (*gm.*)	.82 ± .022	.91 ± .018	1.07 ± .043	1.04 ± .030	.93 ± .014
Calcium/phosphorus	.66	.62	.61	.63	.64

* Standard error of the mean.

Tables 3–5 present the results of examinations of 222 persons both before and after admission to the dining room. The findings on the entire group of 481 persons examined before admission were also analyzed, and the results did not differ significantly from those of the smaller group which were later reexamined. Plasma, vitamin C, vitamin A, and carotene increased somewhat (Table 3). A rise in hematocrit, hemoglobin, or the red blood cell count was scarcely to be expected since the iron intakes before admission were more than adequate. Nor

could much change in blood proteins be expected, since the initial values were good and the protein intakes not unduly low. Vitamin C and vitamin A averages previous to admission must be considered good. Those for vitamin C were somewhat higher than might be expected for the calculated intakes. a record of these is difficult or impossible to obtain. The smaller rise in vitamin C in adult males probably reflects their tendency to reject the high vitamin C foods such as fruits and salads.

Although some rise in certain blood values was evident, it must be admitted that little improvement

TABLE 2

*Comparison between home diets, comedor diets, and National Research Council recommendations**

	CALORIES	PROTEIN	ANIMAL PROTEIN	VITAMIN A	THIAMIN	RIBOFLAVIN	NIACIN	VITAMIN C	Fe	Ca	P
		gm.	%	*I.U.*	*mg.*	*mg.*	*mg.*	*mg.*	*mg.*	*gm.*	*gm.*
Home diet before entering comedor (average person)	1,679	55.5	18	2,583	1.31	.76	6.0	22.2	11.4	.59	.93
Comedor diet calculated from purchase records (average person)	2,434	93.4	43	11,733	2.21	2.09	11.2	133	23.8	.99	1.7
Comedor diet calculated from set of menus used in meal planning (average adult)	2,713	115.4	52	10,719	2.05	2.26	13.7	98	21.4	1.05	2.2
N.R.C. recommendations for average person, calculated for age and sex distribution of study	2,280	62.4		4,018	1.12	1.58	11.2	65.3	11.1	.99	

* Recommended Dietary Allowances. National Research Council Reprint and Circular Series No. 122, August 1945.

TABLE 3

Results of blood analyses before and after subjects had eaten in comedor

AGE (*yr.*)		1-9	10-15	MALES, 16 YR. AND OVER	FEMALES, 16 YR. AND OVER	ENTIRE GROUP
Vitamin C (*mg.*)	*before*	.96 ± .037*	.90 ± .054	.58 ± .068	.67 ± .045	.81 ± .024
	after	1.26 ± .041	1.11 ± .037	.64 ± .064	.80 ± .047	1.01 ± .025
Vitamin A (*I.U.*)	*before*	77 ± 3.4	82 ± 3.5	106 ± 6.8	86 ± 3.9	85 ± 2.2
	after	74 ± 2.2	85 ± 2.0	127 ± 6.7	103 ± 3.1	92 ± 2.6
Carotene (*gammas*)	*before*	110 ± 6.8	129 ± 6.7	114 ± 8.3	131 ± 8.7	122 ± 3.7
	after	117 ± 5.2	127 ± 3.9	132 ± 8.2	155 ± 5.9	132 ± 2.9
Hemoglobin (*gm.*)	*before*	13.9 ± .15	14.8 ± .15	16.6 ± .24	14.1 ± .23	14.6 ± 0.11
	after	14.1 ± .11	14.9 ± .12	16.3 ± .21	14.2 ± .22	14.7 ± 0.09
Hematocrit	*before*	41 ± .43	44 ± .36	49 ± .72	42 ± .59	43 ± 0.30
	after	42 ± .28	45 ± .30	49 ± .62	43 ± .49	44 ± 0.23
Red blood cells (millions)	*before*	4.4 ± .042	4.7 ± .041	5.2 ± .085	4.5 ± .067	4.6 ± .031
	after	4.5 ± .027	4.8 ± .032	5.2 ± .058	4.6 ± .042	4.7 ± .024
Total proteins (*gm.*)	*before*	7.5 ± .068	7.5 ± .064	7.6 ± .064	7.5 ± .071	7.5 ± .034
	after	7.3 ± .059	7.4 ± .071	7.4 ± .087	7.4 ± .080	7.4 ± .037
Albumins (*gm.*)	*before*	5.0 ± .067	5.1 ± .055	5.0 ± .13	4.9 ± .068	5.0 ± .036
	after	5.0 ± .038	5.0 ± .042	5.0 ± .089	4.8 ± .070	5.0 ± .028

* Standard error of the mean.

Several explanations suggest themselves: Mexicans, because of their smaller average size may have a lower vitamin C requirement than peoples to the north; then, too, it is rather common for the Mexican to have a piece of fruit or vegetable or a drink containing fruit juice (2) while away from home, and in nutritional status was demonstrable by results of the later analyses.

Although Table 4 shows slight increase in weight, there was no real change in the ratio of actual to theoretical weight as judged by the Woodbury and Baldwin-Wood tables. These tables have been

TABLE 4

Comparison of weights of subjects before and after eating in comedor

AGE (yr.)	1–9	10–15	MALES, 16 YR. AND OVER	FEMALES, 16 YR. AND OVER	ENTIRE GROUP
Before					
No. persons	81	62	27	44	214*
Actual weight (*kg.*)	17.4	34.3	55.8	53.6	34.6
Ratio actual to theoretical weight	0.96	0.96	0.89	0.98	0.96
More than 10% overweight (%)	1	3	7	23	7
More than 10% underweight (%)	17	19	59	27	25
After					
No. persons	70	67	29	48	214
Actual weight (*kg.*)	18.0	35.0	55.3	53.3	36.3
Ratio actual to theoretical weight	0.95	0.94	0.88	0.99	0.95
More than 10% overweight (%)	1	3	3	19	6
More than 10% underweight (%)	16	22	65	27	27

* There were 8 persons whose measurements were outside the range of the height-weight tables and the data on these, therefore, are not included in the tabulations.

TABLE 5

Incidence of clinical and biomicroscopic findings on subjects before and after eating in comedor

	BEFORE	AFTER
	%	%
Clinical history		
hemeralopia	2	2
photophobia	17	10
burning eyes	20	15
painful tongue	6	0.4
bleeding gums	14	15
anorexia, nausea, or vomiting	11	18
palpitation	7	2
irritability	19	7
tiredness, debility	23	11
cramps, paresthesia, muscle pains	20	21
Physical examination		
dry skin	10	15
hyperkeratosis	1	1
angular cheilosis	2	0.4
heart murmur	3	3
edema	1	0.4
hypertension	2	2
corneal vascularization	46	47
conjunctival changes		
total	57	65
marked	28	24
gingivitis		
total	96	75
marked	32	19
glossitis		
total	81	70
marked	28	21

found useful when applied to some populations in Mexico City (1), although they are not suited to certain Indian groups (2). Curves of height and of weight plotted against age also showed no significant differences between the first and second examinations. This, we believe, indicates that calorically at least, the original diet was not seriously deficient.

Data in Table 5 indicate a decrease in photophobia, burning eyes, and painful tongue. Although none of these may be considered as necessarily symptoms of nutritional deficiency, it is not unlikely that their decrease does reflect the improved intake of vitamin B complex, particularly of niacin and riboflavin. Some improvement in the tongues was demonstrable by slit lamp. It is interesting that, if anything, there was an increase in anorexia. This may be an illustration of the fact that persons constantly in danger of going hungry are less likely to complain of poor appetite than those to whom a liberal supply of food is available. The symptoms of palpitation, irritability, tiredness, and debility, while at times attributable to nutritional failure, are so subject to psychological influences that one cannot ascribe much nutritional significance to their decreased incidence. The improvement in morale occasioned by the greater economic security and other features of the dining room may have been an important factor.

In addition to the physical findings included in Table 5, we encountered a considerable variety of other clinical conditions which are not listed. The incidence of positive serological findings for syphilis (Kahn and Kline) was 5 per cent, with a 9 per cent incidence in adult males.

All slit lamp examinations were carried out by the same person. It can be seen (Table 5) that in spite of the marked increase in riboflavin intake no real change in incidence of corneal vascularization occurred. Practically all the corneal invasions were of mild degree. We are becoming sceptical of corneal vascularization as an aid to diagnosis of riboflavin deficiency unless the invasion is marked (17). There was apparently some increase in the total incidence of conjunctival changes but a decrease in severity.

Neither change is probably great enough to be considered of much significance. Improvement in the gums was definite, but the better dental hygiene encouraged in the institution may have had as much to do with this as did the increased vitamin C intake. There was no gingivitis that appeared to be indicative of scurvy. The improvement in the tongues was not dramatic but is probably significant. Some would be expected as a result of the increased vitamin B complex intake.

We had planned to give large doses of synthetic vitamins for an extended period to one group just entering the *comedor* and to another that had been eating there for some time, and to compare any beneficial effects with control groups, particularly in order to evaluate the effects on the controversial slit lamp findings. Such an experiment was started, but owing to lack of sufficient cooperation, considerable turnover in the families, and finally the sudden and unexpected closure of the institution for a considerable period for necessary repairs, the experiment had to be abandoned. However, a few of the more cooperative persons took 75,000 I.U. vitamin A, 150 mg. niacin, 15 mg. riboflavin, or 300 mg. ascorbic acid daily with fair regularity for a period of 7 to 8 months. No definite improvement from these large doses was apparent.

SUMMARY

A study of the nutritional status of a group of economically poor families before and after eating for an average period of 13 months in a government-operated family dining room in Mexico City is discussed.

The diets of these persons before they ate at the dining room were better than might have been expected, judged by the economic status of the families. However, compared with the National Research Council's recommended allowances, the diets were moderately to markedly low in all calculated nutrients with the exception of iron and thiamin. The diet available in the dining room was excellent.

Hemoglobin, red blood cell count, hematocrit, and blood proteins were not significantly changed by the improved diet. The average blood values for vitamin C, vitamin A, and carotene, not particularly low before admission to the dining room, showed some rise.

On physical examination little improvement was evident. Weights had not improved. There was some decrease in certain of the symptoms possibly attributable to nutritional causes, but their significance is questionable. Slit lamp examination did not demonstrate improvement in corneal vascularization, or conjunctival changes. The tongues and gums showed some improvement but the change in the latter was believed to be largely due to better mouth hygiene.

The failure to demonstrate more improvement must be due either to a better nutritional status on entry than was assumed to exist on the basis of the dietary studies, or to failure of the physical and laboratory methods to detect mild degrees of deficiency or of nutritional improvement. It is believed that both factors were operative.

Until methods can be further evaluated and improved, failure to demonstrate nutritional betterment more definitely should not prejudice continued attempts at improving food intakes.

REFERENCES

(1) Robinson, W. D., Payne, T. D., and Calvo, J.: A study of the nutritional status of a population group in Mexico City. J. Am. Dietet. A. 20: 289, 1944.

(2) Anderson, R. K., Calvo, J., Serrano, G., and Payne, G. C.: A study of the nutritional status and food habits of Otomi Indians in the Mezquital valley of Mexico. In press.

(3) Anderson, R. K., Robinson, W. D., Calvo, J., and Payne, G. C.: The nutritional status during pregnancy and after delivery of a group of women in Mexico City. In press.

(4) Cravioto, R., Lockhart, E. E., Anderson, R. K., Miranda, F., and Harris, R. S.: Composition of typical Mexican foods. J. Nutrition 29: 317, 1945.

(5) Wintrobe, M. M.: Clinical Hematology. Philadelphia: Lea & Febiger, 1942.

(6) Robinson, H. W., and Hogden, C. G.: Biuret reaction in determination of serum proteins. J. Biol. Chem. 135: 707, 1940.

(7) Kimble, M. S.: Photocolorimetric determination of vitamin A and carotene in human plasma. J. Lab. & Clin. Med. 24: 1055, 1939.

(8) Midlin, R. L., and Butler, A. M.: Determination of ascorbic acid in plasma: A macromethod and micromethod. J. Biol. Chem. 122: 673, 1938.

(9) Youmans, J. B., Patton, E. W., and Kern, R.: Surveys of the nutrition of populations. Description of population, general methods and procedures, and the findings in respect to the energy principle (calories) in a rural population in Middle Tennessee. Part 2. Am. J. Pub. Health 33: 58, 1943.

(10) Milam, D. F., and Anderson, R. K.: Nutrition survey of an entire rural county in North Carolina. South. Med. J. 37: 597, 1944.

(11) Milam, D. F., and Darby, W. J.: The average diet of a southern county and its effects on nutritional status. South. Med. J. 38: 117, 1945.

(12) Segura Millan, R.: Dietary conditions in some Mexican rural communities. J. Am. Dietet. A. 18: 521, 1942.

(13) Melnick, D.: A critique of values suggested as the thiamin requirement of man. J. Am. Dietet. A. 20: 516, 1944.

(14) Williams, R. D., Mason, H. L., Cusick, P. L., and Wilder, R. M.: Observations on induced riboflavin deficiency and the riboflavin requirement of man. J. Nutrition 25: 361, 1943.

(15) Cravioto, R., Anderson, R. K., Lockhart, E. E., Miranda, F. de P., and Harris, R. S.: Nutritive value of the Mexican tortilla. Science 102: 91, 1945.

(16) Bodansky, A.: Phosphatase studies: Determination of serum phosphatase. Factors influencing accuracy of determination. J. Biol. Chem. 101: 93, 1933.

(17) Anderson, R. K., and Milam, D. F.: Biomicroscopy of the eyes in evaluation of nutritional status. Conjunctival changes. J. Nutrition 30: 17, 1945.

Activity as it Affects the Basal Metabolism of College Women[1]

CHARLOTTE M. YOUNG[2] and
EVA G. DONELSON[3]

THOSE engaged in the North Central States Cooperative Project on the Nutritional Status of College Women have been in search of a practical measuring stick for the nutritional status of college women. The effect of the strain of an extremely active and variable college existence with its possible influence on nutrition has been particularly elusive of measurement. This strain becomes increasingly evident in the junior year when a number of forces operate to reduce the student's quota of unorganized leisure to a minimum: *i.e.*, the junior year marks the beginning of specialized work in the major field; positions of leadership are assumed by those interested in extracurricular activities; house rules are less stringent for upperclasswomen, and many whose funds are becoming depleted find outside work necessary.

The net result of all this is that there is more and more competition for the student's time so that freedom for rest and relaxation is cut to a minimum. It is possible that an opportunity for rest may bring a complete relaxation beyond that ordinarily present, or may be expressed as an inability to relax completely or rapidly.

In this project, basal metabolism records of college women for 3 and 4-year periods have been accumulated and studied for variability in successive years. It was found that the variability of the basal metabolism increased in the third and fourth years of observation, *i.e.*, the junior and senior years, in spite of the fact that the effect of practice in the test procedure would logically be expected to decrease it. On investigation the increase was found to be due wholly to the influence of a few individuals on whose records notations of extra activity, work, etc., had been made and who had previously been defined as overtired. The case studies presented subsequently are typical, namely: that of the very active individual whose records brought the increased variability (Subject No. 43); and of the relatively inactive individual whose basal metabolism did not increase in variability in the third and fourth years (Subject No. 91).

On the basis of these observations the authors proposed the hypothesis that in well-poised individuals who are unusually active and who have had limited rest and relaxation, there may develop a certain strain which limits the capacity of the body to relax rapidly and uniformly. This logically would be manifested in an increased day-to-day variability of the basal metabolism.

On the basis of this hypothesis one would expect a rather high variability in the basal metabolism in the freshman year, due to the newness of the testing situation and adjustment to college. In the sophomore year the average student would be under less strain, so that variability should be less than at any other time, but one would expect it to increase again in the junior and/or senior year if the individual is one who engages actively in any extracurricular activities. For individuals who follow a rather phlegmatic, uneventful course through college, one would expect little or no increase in the variability of their metabolism in the junior and senior years; in fact a decrease would be possible as the individual becomes better adjusted to the test.

EXPERIMENTAL

The feasibility of the foregoing hypothesis has been tested by a study of the variability of the basal metabolism of a group of very active young women as contrasted to a group of less active women.

The laboratory at Iowa State College has followed the basal metabolism of 33 women through 3 years of

[1] Approved for publication by the Advisory Committee as Paper No. 12 of the Regional Project of the North Central States relating to the Nutritional Status of College Women. Received for publication May 14, 1945.

[2] Now on the staff of the New York State College of Home Economics at Cornell University; formerly, Department of Foods and Nutrition, Iowa State College. Journal Paper No. J997 of the Iowa Agricultural Experiment Station, Ames, Project 538.

[3] Division of Home Economics, University of Minnesota. Paper No. 1917, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul.

college life; that at the University of Minnesota, 45 women through 3 years and 20 for a 4-year period. The basal metabolism observations were made in the manner described in a previous paper of this series.[4] The records from these groups have been examined. For both schools the data were then subdivided into active and inactive subgroups. Classification was on the basis of a summation of all obtainable records of the students' curricular and extracurricular life and on the previously recorded impressions of the workers in the laboratory of the presence of undue strain.

The numbers of individuals in each group are indicated in Tables 1 to 6, inclusive.

From these 2 subgroups the following case studies are presented to illustrate further the type of information on which the classification was based:

TABLE 1

Analysis of variance of basal metabolism of 14 active individuals through 3 successive years in college (Iowa State College)

SOURCE OF VARIATION	D. F.	FIRST YEAR	SECOND YEAR	THIRD YEAR
		Mean Square	Mean Square	Mean Square
Total	55			
Individual	13	25.33**	18.04**	20.96**
Days on same individual	14	1.545	0.7000	3.684**
Tests on same day	28	1.283	0.4354	0.4161
Mean metabolism, in calories per square meter per hour		36.19	34.64	34.02

** Statistically highly significant.

TABLE 2

Analysis of variance of basal metabolism of 27 active individuals through 3 successive years in college (University of Minnesota)

SOURCE OF VARIATION	D. F.	FIRST YEAR	SECOND YEAR	THIRD YEAR
		Mean Square	Mean Square	Mean Square
Total	107			
Individual	26	23.29**	13.45**	24.99**
Days on same individual	27	4.713**	1.962**	3.713**
Tests on same day	54	0.9087	0.5820	1.259
Mean metabolism, in calories per square meter per hour		35.96	34.67	33.49

** Statistically highly significant.

TABLE 3

Analysis of variance of basal metabolism of 13 active individuals through 4 successive years in college (University of Minnesota)

SOURCE OF VARIATION	D. F.	FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR
		Mean Square	Mean Square	Mean Square	Mean Square
Total	51				
Individual	12	14.43**	5.810**	5.148**	10.01**
Days on same individual	13	5.682**	0.8415	3.672*	4.523**
Tests on same day	26	1.087	0.5719	1.652	0.8604
Mean metabolism, in calories per square meter per hour		35.54	34.63	33.47	33.34

* Statistically significant.
** Statistically highly significant.

TABLE 4

Analysis of variance of basal metabolism of 9 relatively inactive individuals through 3 successive years in college (Iowa State College)

SOURCE OF VARIATION	D. F.	FIRST YEAR	SECOND YEAR	THIRD YEAR
		Mean Square	Mean Square	Mean Square
Total	35			
Individual	8	27.62**	15.60**	24.68**
Days on same individual	19	5.083**	0.6989	0.3422
Tests on same day	18	1.271	1.105	0.2400
Mean metabolism, in calories per square meter per hour		35.11	34.29	33.32

** Statistically highly significant.

TABLE 5

Analysis of variance of basal metabolism of 18 relatively inactive individuals through 3 successive years in college (University of Minnesota)

SOURCE OF VARIATION	D. F.	FIRST YEAR	SECOND YEAR	THIRD YEAR
		Mean Square	Mean Square	Mean Square
Total	71			
Individual	17	19.34**	20.12**	11.86**
Days on same individual	18	3.117	2.789**	2.543**
Tests on same day	36	1.753	.8869	.9333
Mean metabolism, in calories per square meter per hour		35.22	34.96	33.83

** Statistically highly significant.

[4] Young, C. M., Pittman, M. S., Donelson, E. G., and Kinsman, G. M.: The effect of the selection of data on the mean basal metabolism and the variability of the basal metabolism of a large series of college women. Am. J. Physiol. 139: 280, 1943.

Subject No. 43 Major: Dietetics
Residence: Sorority House
Scholastic record:
Entrance test: B9
High School Quality Point Average: 3.45
College Quality Point Average: 2.981
Medical: negative
Activity:
Freshman:
a. Music: band, band tour 6 days in March; orchestra
b. Women's Athletic Association: Outing Club, Saturday hikes
c. Young Women's Christian Association: member
d. Danforth Scholarship as outstanding freshman home economist in America
Summer: Foods counselor, Young Women's Christian Association; playhouse in June and July; camp in August
Sophomore:
a. Music: band, band tour, orchestra; piano lesson fall and winter quarter
b. Associated Women's Societies: secretary; delegate to convention in Michigan in April
c. Women's Athletic Association: elected to Naiads, honorary swimming organization
d. Young Women's Christian Association: poster committee
e. Professional: proofreader for Homemaker Staff; cherry pie committee
f. Sorority: pledge activities
Summer: Summer school in Milwaukee; camp for two weeks; work in office for six weeks
Junior:
a. Music: elected to Sigma Alpha Iota in January
b. Associated Women's Societies: junior class representative; chairman of tea for freshman candidates; chairman of book loan fund; committee on point system
c. Young Women's Christian Association: chairman of weekly radio programs; Association Cabinet; chairman and toastmistress Geneva banquet for Iowa Young Women's and Young Men's Christian Associations; invitations committee for banquet; vice-president
d. Professional: elected to Phi Upsilon Omicron; president Phi Upsilon Omicron; chairman of home economics floats for parade
e. Mortar Board: president
f. Religious Emphasis Week: radio chairman; dinner committee
g. Sorority: volleyball team; chairman of decorations for spring formal sing; corresponding secretary
Summer: flu for ten days; camp ten days in August
Senior:
a. Music: Sigma Alpha Iota
b. Young Women's Christian Association: finance chairman and vice-president
c. Professional: president Phi Upsilon Omicron; fruit cake chairman; co-chairman, Ellen H. Richards Day
d. Mortar Board: president; co-chairman Mortar Board Recognition Dinner
e. Sorority: corresponding secretary

Subject No. 91 Major: Home Economics Education
Residence: Dormitory
Scholastic record:
Entrance test: C5
High School Quality Point Average: 3.55
College Quality Point Average: 2.555
Medical: negative
Activity: No particular activities throughout college

Analysis of variance was made on the data of each group for each year. The amount of variability in the basal metabolism from day to day was taken as an indication of the ability of the student to relax uniformly at each testing period.

TABLE 6

Analysis of variance of basal metabolism of 7 relatively inactive individuals through 4 successive years in college (University of Minnesota)

SOURCE OF VARIATION	D. F.	FIRST YEAR	SECOND YEAR	THIRD YEAR	FOURTH YEAR
		Mean Square	Mean Square	Mean Square	Mean Square
Total	27				
Individual	6	10.68**	13.26**	6.470**	3.838**
Days on same individual	17	2.850*	3.246	2.626**	1.118
Tests on same day	14	0.8043	1.311	0.5993	0.6857
Mean metabolism, in calories per square meter per hour		34.14	35.77	33.78	33.24

* Statistically significant.
** Statistically highly significant.

RESULTS

Tables 1 to 3 confirm the type of response which was expected for the active individuals. For the Iowa group, the difference in the record from day to day for the same individual decreased in the sophomore year and then increased in the junior year. A similar trend was found in both of the Minnesota groups (Tables 2 and 3). For the 3-year group the day-to-day variability decreased in the sophomore year and then came up in the junior year; in the 4-year group, the same picture held with an even further increase in day-to-day variability in the senior year.

A similar treatment of the data for the inactive individuals of the Iowa and Minnesota groups is presented in Tables 4 to 6. For Iowa, the day-to-day variability in basal metabolism decreased in the sophomore year and decreased still further in the junior year. A like picture was found for both the Minnesota 3 and 4-year inactive groups. These

findings are in sharp contrast to the variability trend in the very active groups. These inactive individuals apparently reflected only an increasing adjustment to the test, and the variability studies on them furnish complemental evidence for the hypothesis presented. Though further proof for this hypothesis would be desired, these observations suggest that the variability of the day-to-day metabolism, if not obscured by arbitrary selection of data, may be a tool whereby one could measure some of the effects of the varying influences of college life on the individual.

SUMMARY

The hypothesis is advanced that the strain of increased activity under which many upperclass college women work is reflected in an increased day-to-day variability in their basal metabolism. Evidence is presented to substantiate this hypothesis.

The Army Dietitian in Japan

WITH REGARD to the customs of the Japanese and their food habits, I will give you as much information as I have obtained which may be of interest to you.

We came by rail from Wakayama to Kyoto. The trains are run by electricity and although not so modern as ours, they are rather similar. We had difficulty in obtaining Pullman cars as they are reserved only for the Japanese men—the women have to ride in day coaches. Our Transportation Officer threatened to stop the trains for the day, so we had our Pullmans. We were quite a sensation to the people as we were the first American women they had seen. As we stopped at each station, numerous Japs crowded the platforms, seeming quite spellbound. We arrived in Kyoto the same afternoon. Representatives of the Japanese press were at the station and took pictures of us, as did the U. S. Signal Corps. We have taken over a Japanese hospital, the best in the city, and have only Army personnel as patients. The hospital was very dirty and infested with rats and bugs, but after days of cleaning, it is beginning to look a little presentable.

When a Japanese is admitted to a hospital, the whole family moves in and remains through the period of illness. Their dietary problems are relatively few, as their food consists principally of fish, rice and soybeans. Their principal fruit is *nasi*, which tastes somewhat like a pear but is shaped like an apple, yellow in color, and with a rough skin. They also have onions and very large persimmons. I am told that in the mountainous regions tangerines are grown, but we haven't seen any. We are not allowed to buy any of their food items as they have hardly enough food to furnish the population here. At first we had to content ourselves with K rations and "10-in-1" but now the Quartermaster has opened his stores and we have been getting some butter and meat. We have not had special rations for the patients as yet, but that will probably be solved in the near future. Although there is no refrigeration, the weather is cold and we receive our perishables in amounts sufficient only for two days.

Our mess department is not what we consider ideal but it serves the purpose. Owing to lack of space we have to feed the ambulatory patients and the detachment in the same mess. We are building a roof over a veranda which when completed will be the patients' mess. We have only Army personnel handling the food but we have Japanese waitresses who are paid by the Japanese Government. We give them three meals a day and they are very courteous and quick to learn. They wear suits similar to our ski suits. They do not wear coats, but when the weather is cold they wear additional clothes under the suits.

This town hasn't been damaged by the war and it is very clean compared with other Oriental towns. There are plenty of souvenirs for sale but very little that is worth buying. They are not allowed to sell us silk, only some lacquered dishes and these are very high-priced.

Yesterday a Japanese woman invited us to her home for tea. As we entered, we had to remove our shoes and follow her to a room in the rear where we sat on pillows. We had one male officer with us and the woman waitress was not allowed to pass the tea to him. She passed it to one of us to show that she was too humble to serve a male guest. After the tea, of a very delicate flavor, was served, we were not asked to remain, but left immediately. Moving to the outer room, we found our shoes neatly brushed and arranged in a row.

The Japanese women are very unimportant. There are three types: the very low type or prostitutes; the wives, who bear the children and do the work in the fields; and the geishas who assist the men with their business and entertain them. The geishas dress better than the others, and are allowed to wear lipstick and powder. The Japanese women who work around the hospital are very honest and willing to do anything for us.—*Excerpts from a letter addressed to Major Helen C. Burns by Lt. Helena D. Quinn, on duty in Kyoto, Honshu, Japan.*

Variations in the Basal Metabolism of Midwestern College Women[1]

MARTHA S. PITTMAN, VIRGINIA BAXTER, EDITH DAWLEY STOKELY,[2] MARGARET A. OHLSON, CHARLOTTE HERMAN,[3] EVA DONELSON, DORIS GRAMBOW,[4] HUGHINA McKAY, MARY BROWN PATTON,[5] and WILLIAMINA ARMSTRONG HIMWICH[6]

A PREVIOUS study by workers in the regional cooperative project of the North Central States (1) indicated significant differences in the basal metabolic rates of college women from Iowa, Kansas, Minnesota, Ohio, and Oklahoma. In general, the basal rates were slightly lower in the warmer climates but the coldest weather did not always produce the highest rates. Because of these discrepancies it was considered desirable to study the effects upon basal metabolism of season and such associated factors as outside temperature, humidity, and hours of sunshine. To secure the necessary data, frequent basal tests over a considerable period were made upon a few subjects from each of the above states.

Whether or not temperature affects the basal rate is a disputed question. A review of the literature shows conflicting evidence as to the effects of climate and season upon basal metabolism. Those who accept these factors as effective agents do not agree upon how they affect the basal rate. Several investigators (2–5) noted no significant seasonal variations in basal rates although "noticeable differences" were sometimes observed; others (6–8) observed that the basal metabolism tended to be lower in winter than in summer. In contrast to this, a number of workers (3, 4, 9–14) agreed that the basal metabolic rate is somewhat low in a warm climate, but Coons and Schiefelbusch (9) and Remington and Culp (14) did not attribute their low results to temperature. Griffith *et al.* (15) found seasonal changes which varied with the subjects to the extent that these workers assumed that climate affected metabolism only indirectly.

According to Talbot *et al.* (16), the published data up to 1937 indicated that climate and geographical location were the chief causes of differences in the basal rates noted in different localities. DuBois (17) suggested that the time may come when standards will be adjusted for different regions according to climatic conditions.

Explanations for a low basal rate other than climate and season have included poor dietary habits, a low state of nutrition, a low protein intake, and a deficient iodine supply. Attempts have been made to relate variations in basal rate to seasonal variation in iodine content of the thyroid gland as well as to differences in technique and interpretation of data.

Little correlation has been found between basal metabolism and body temperature, pulse, and rate of respiration, or such environmental conditions as outside temperature, humidity, sunshine, and rainfall.

PROCEDURE

A total of 10 college women served as subjects. These were distributed as follows: Iowa, 2; Kansas, 2; Minnesota, 2; Ohio, 3; and Oklahoma, 1. The age of each subject to her nearest birthday at the beginning of the study, the total number of tests for each subject, and the number of weeks each one was studied are shown in Table 1.

All the young women appeared to be in good health and there were no evidences of thyroid disturbances. However, not all of the subjects had physical examinations.

[1] Approved for publication by the Advisory Committee as Paper No. 25 of the Regional Project of the North Central States relating to the Nutritional Status of College Women. Received for publication September 17, 1945.

[2] Contribution No. 126, Department of Home Economics, Kansas Agricultural Experiment Station, Manhattan.

[3] Journal Paper No. J1266 of the Iowa Agricultural Experiment Station, Ames, Project 749.

[4] Paper No. 2215, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul.

[5] Approved for publication by the Ohio Agricultural Experiment Station, Wooster.

[6] Approved for publication by the Oklahoma Agricultural Experiment Station, Stillwater.

The methods used were those described previously (1) and which are accepted as desirable. Weekly determinations were planned but were not always made, particularly if a subject served over a comparatively long period. No tests were made during the Christmas holidays for obvious reasons. For 5 subjects the study covered only 3 seasons. Summer, because of the vacation period, was the one omitted and when tests were given during this period they were usually fewer in number than in the other seasons. Practically no data were secured during August.

Duplicate determinations were made on the morning of a test and the mean of these was used as the basal rate for that subject for that particular day. In this respect the method varied from that of the earlier study (1) in which the mean of 4 tests made on 2 different days was used as the basal metabolic rate. Another difference in the present investigation was that no attempt was made to avoid the menstrual period. This change was obviously necessary if weekly tests were to be secured.

TABLE 1

General data

STATE	SUBJECT	AGE*	TESTS	WEEKS STUDIED	METABOLISM RATE			
					Mean	Standard error	Median	Range
		yr.	*no.*		*cal./sq.m./hr.*			
Iowa	OJS	19	55	91	31.96	0.665	30.81	27.10–54.53
	HR	22	27	55	34.08	0.897	33.27	27.25–53.27
Kans.	AG	19	47	91	33.29	0.327	32.49	29.26–39.34
	BW	18	54	104	32.20	0.211	32.67	28.96–35.11
Minn.	DG	24	33	57	30.41	0.257	30.58	26.51–32.82
	MJ	18	33	45	35.12	0.289	34.92	32.03–40.36
Ohio	RI	19	26	45	34.78	0.200	34.99	32.22–36.88
	JS	20	30	46	34.04	0.310	33.95	31.05–37.84
	WS	20	31	45	35.77	0.281	35.46	33.08–39.02
Okla.	EB	18	17	20	36.89	0.595	36.86	31.02–42.44

* To nearest birthday at beginning of experiment.

RESULTS AND DISCUSSION

The calories per square meter per hour for the entire period of study for the different subjects showed the usual intra- and inter-individual variations. An analysis of variance in the earlier study, which indicated that interstate differences were significant, prompted another analysis using the present data. This analysis verified the previous work. Consequently, the results for the different states in this study are considered separately.

The mean basal rates for the 10 subjects expressed as calories per square meter per hour are shown in Table 1. The mean seasonal rates for each subject appear in Table 2. Unfortunately, only half of the subjects had summer tests and, of these, Subject DG had only one. Considering the basal rates of these 5 subjects whose tests covered 4 seasons, 3 were lowest in summer, one in the fall, and the other in the spring. The two Kansas subjects reacted similarly, both being highest in the fall and lowest in the summer. The differences in the rates for these two subjects through fall to summer were slight but were consistently in the direction of a gradual decline, the greatest fall in each case coming between spring and summer. The rise from summer to fall was considerable, amounting to 8.7 per cent for Subject AG and 6.6 per cent for Subject BW. None of the 10 subjects reached a peak during the winter season and 3 were lowest at this time (MJ, MS, and WS). It must be remembered, however, that MS and WS had no summer tests. The results with the 2 Minnesota subjects were highest in summer and next highest in spring, but the differences were slight, especially for Subject DG. The Iowa student, OJS, with tests covering 4 seasons, was lowest in summer and highest in fall. Subject RI, Ohio, showed practically no variation over the 3 seasons she was observed.

TABLE 2

Mean seasonal differences in basal rates

STATE	SUBJECT	SEASON							
		Winter		Spring		Summer		Fall	
		No. tests	cal./sq.m./hr.	No. tests	cal./sq.m./hr.	No. tests	cal./sq.m./hr.	No. tests	cal./sq.m./hr.
Iowa	OJS	14	31.29	18	33.50	7	30.76	16	31.36
	HR	9	34.31	10	33.38	0		8	34.74
Kans.	AG	14	33.64	11	33.19	6	31.80	16	34.14
	BW	17	32.55	14	32.00	7	30.66	16	32.83
Minn.	DG	10	30.46	8	30.65	1	31.70	14	30.16
	MJ	9	34.04	7	35.91	7	36.16	10	34.80
Ohio	RI	8	34.84	7	34.94	0		11	34.64
	JS	11	32.76	8	35.64	0		11	34.15
	WS	11	35.17	8	35.90	0		12	36.23
Okla.	EB	8	36.94	4	37.80	0		5	36.12

Analyses of variance for the individual subjects were made in an attempt to determine if the seasonal differences were significant. For 6 subjects they seemed to be, for the other 4 they did not. It appeared that the individuals who apparently were affected by this factor did not respond alike in the different seasons.

Calories per square meter per hour showed little correlation with pulse and respiration rates, body

temperature, outside temperature, humidity, or hours of sunshine per week. In two instances the results were significant for both pulse and respiration. Outside temperature and humidity gave no evidence of correlation with the basal rate. Outside temperature was used as the mean of the maximum and minimum temperatures for the week of the test. It was expected that temperature might have much to do with the seasonal rates obtained. Why the results were not significant for any subject, especially since season was apparently a significant factor for some, is not easily explained. It is probable that these young women had limited contacts with the outside temperature. The lack of correlation also suggests that factors other than temperature affected results obtained in a given season. In only 2 of the 7 cases for which data were available did the hours of sunshine per week seem to be significant. Season was evidently the most important of the factors studied but it apparently did not affect all subjects, nor did those affected always react in the same way. This work appears to be in agreement with that of Griffith *et al.* (15).

SUMMARY

The basal metabolic rates of 10 college women distributed among 5 midwestern states deviating considerably in temperature and other climatic conditions were studied over periods varying from 20 to 104 weeks for the different subjects. The individual tests, ranging in number from 17 to 55, showed a good deal of variation for the same subject over the period of the investigation.

Season was apparently a significant factor affecting basal rate for 6 of the 10 subjects, although the response to it was not uniform. Pulse, respiration, body temperature, outside temperature, humidity, and hours of sunshine were seemingly minor factors in the results obtained.

REFERENCES

(1) Pittman, M. S., Cederquist, D., Kunerth, B. L., Shinkle, V., Ohlson, M. A., Young, C. M., Donelson, E., Wall, L. M., McKay, H., Patton, M. B., and Kinsman, G. M.: The basal metabolism of midwestern college women. Am. J. Physiol. 140: 33, 1943.

(2) Benedict, F. G., and Carpenter, T. M.: Food ingestion and energy transformations with specific reference to the stimulating effect of nutrients. Carnegie Inst. of Washington, Pub. 261, p. 115, 1918.

(3) Tilt, J.: The basal metabolism of young college women in Florida. J. Biol. Chem. 86: 635, 1930.

(4) Tilt, J., and Walters, C. F.: A study of the basal metabolism and diet of normal young college women in Florida. J. Nutrition 9: 109, 1935.

(5) McClendon, J. F., and Olson, P.: Failure to find seasonal variation in the basal metabolic rate. Endocrinology 27: 160, 1940.

(6) Gustafson, F. L., and Benedict, F. G.: The seasonal variation in basal metabolism. Am. J. Physiol. 86: 43, 1928.

(7) Hitchcock, F. A., and Wardwell, F. R.: Cyclic variations in the basal metabolic rate of women. J. Nutrition 2: 203, 1929–30.

(8) McKay, H.: Basal metabolism of young women. Ohio Agric. Exper. Sta. Bull. 465, 1930.

(9) Coons, C. M., and Schiefelbusch, A. T.: The diets of college women in relation to their basal metabolism. J. Nutrition 5: 459, 1932.

(10) Hafkesbring, R. H., and Collett, M. E.: Day-to-day variations in the basal metabolism of women. Am. J. Physiol. 70: 73, 1924.

(11) Hafkesbring, R. H., and Bergstrom, P.: Studies of basal metabolism in New Orleans. Am. J. Physiol. 79: 221, 1926–27.

(12) Mason, E. D.: The basal metabolism of European women in South India and the effect of change of climate on European and South Indian women. J. Nutrition 8: 695, 1934.

(13) McCord, J. S.: Basal metabolism of Indiana University women. J. Am. Dietet. A. 15: 440, 1939.

(14) Remington, R. E., and Culp, F. B.: Basal metabolic rate of medical students and nurses in training at Charleston, South Carolina. Arch. Int. Med. 47: 366, 1931.

(15) Griffith, F. R., Jr., Pucher, G. W., Brownell, K. A., Klein, J. D., and Carmer, M. E.: Studies in human physiology. I. The metabolism and body temperature (oral) under varying conditions. Am. J. Physiol. 87: 602, 1928–29.

(16) Talbot, F. B., Wilson, E. B., and Worcester, J.: Basal metabolism of girls. Am. J. Dis. Child. 53: 273, 1937.

(17) DuBois, E. F.: Basal Metabolism in Health and Disease. 3rd ed., p. 196. Philadelphia: Lea and Febiger, 1936.

Opportunities for Professional Personnel in Children's Bureau. If and when a nationwide maternal and child health program is undertaken, such as is now being proposed, thousands of opportunities for professionally-trained men and women will be open, Dr. Martha M. Eliot, associate chief of the Children's Bureau, U. S. Department of Labor, predicted in a release dated February 21, urging that this possibility be held before young people now choosing a career.

"Good medical care and health services, in one form or another," Dr. Eliot predicted, "must some day be brought within reach of all mothers and children everywhere in the country, for we as a people will not forever tolerate the present waste of the health and energies of our children. When we undertake getting care to all, we are going to need highly trained men and women for the job."

Proposals for such a program, with 10 years set as the time limit for its accomplishment, are now being put forward by the National Commission on Children in Wartime. This commission, which is made up of men and women prominent in the child health and child welfare field, is calling for an expansion of maternal and child health services of the kind now being operated by the states under the Social Security program, but on a scale that would make good care available to "the thousands of mothers and children not now being reached."

Dr. Eliot urged that young men and women from the armed forces who have opportunities for training under the G. I. Bill of Rights bear these future possibilities in mind when deciding upon further courses of study. Many have had experience in the service that is in line with that needed for operation of such public health programs. Not only doctors, dentists and psychiatrists, and public health administrators are needed, but also nurses, physical therapists, medical and psychiatric social workers, and others in related fields.

Effect of Guava Juice and Papaya on the Acidity of the Urine[1]

WINIFRED ROSS and EVA HARTZLER

Hawaii Agricultural Experiment Station, Honolulu

PAPAYAS and guavas are two tropical fruits of great interest to the nutritionist because of their high ascorbic acid content (1). As they may often be eaten in large amounts in the tropics, it is desirable to know the effect on acid-base balance of eating quantities of these foods when they are to be used in either normal or therapeutic diets.

Almost all fruits, even those containing appreciable amounts of acid, have a base-forming ash and tend to decrease the acidity of the urine (2). A few—cranberries, prunes, and plums—show a base-forming ash when analyzed by chemical means, but when eaten they increase the acidity of the urine because the organic acids they contain are not completely oxidized in metabolism (2, 3).

Although papayas are a bland tasting fruit and guavas vary in flavor from insipid sweet to very sour, both have been shown to have titratable acid. Miller and Robbins (4) reported results of a chemical analysis of papayas which showed them to have an acid content of 0.13 per cent (expressed as citric), but a base-forming value of 5.7 ml. N alkali per 100 gm. As tested in this laboratory the *p*H of papaya pulp was 5.2. Samples of guava juice (a watery extract of guavas) tested in this laboratory in the past have been found to vary in *p*H from 2.8 to 4.2. The guava juice used for the experiment reported here had a *p*H of 3.1 and an acid content of 1.73 per cent (expressed as citric). No report of a determination of the reaction of the ash of guavas has been found.

The study reported here was undertaken to determine in human subjects the effect of guava juice and papaya on urinary acidity.

EXPERIMENTAL

Six subjects, 3 men and 3 women, ate their meals in the nutrition laboratory for 1 week. All food was weighed on a gram scale and nothing was eaten outside the laboratory. For the first 3 days the diet eaten was calculated to be neutral, the base-forming foods exactly balancing the acid-forming. Meat, eggs, whole wheat bread, milk, potatoes, other vegetables, and fruits were used in this basal diet, which was calculated to meet all nutritive needs and provided a minimum of 1700 calories. Individual differences were allowed for by planning larger servings for some and by offering butter, salad oil, and sugar (neutral foods) as desired in addition to the basal diet. All the subjects stated that the food adequately satisfied their appetites. For the second 3 days each individual repeated

TABLE 1

Daily values for pH and titratable acidity of urine of subjects on basal and supplemented diets

SUBJECTS	A	B	C	D	E	F
	pH values					
Basal period:						
1st day	5.9	5.9	6.0	6.7	6.2	6.0
2nd day	5.9	5.1	6.1	6.1	5.6	5.7
3rd day	5.8	5.2	6.0	6.5	6.4	5.5
Supplemented period:	*Papaya*			*Guava juice*		
1st day	5.7	5.2	6.1	5.9	6.3	5.7
2nd day	5.8	5.2	6.0	7.3	6.3	6.0
3rd day	5.9	5.7	6.5	6.9	6.5	6.6
	ml. N acid per 24 hr.					
Basal period:						
1st day	34.4	34.2	28.2	23.3	29.2	43.6
2nd day	35.5	44.4	26.9	33.4	29.7	44.7
3rd day	41.3	49.8	29.6	25.1	24.6	54.1
Supplemented period:	*Papaya*			*Guava juice*		
1st day	39.0	47.2	34.0	28.7	22.9	46.1
2nd day	36.2	46.1	27.4	16.6	28.9	38.5
3rd day	30.4	40.0	22.9	24.0	21.2	26.0

[1] Published with the approval of the Director, Hawaii Agricultural Experiment Station, as Technical Paper No. 129. Received for publication August 13, 1945.

exactly his food intake of the first period and in addition ingested a weighed amount of either guava juice or papaya.

The *p*H of each subject's sample of 24-hr. urine was determined daily by a Beckman *p*H meter; the titratable acidity, by titration with 0.2 N sodium hydroxide using phenolphthalein as an indicator.

RESULTS AND DISCUSSION

Table 1 summarizes the daily values for *p*H and acidity of the urine. During the basal period the *p*H of the urine fell slightly from day to day, and the titratable acidity tended to rise. We concluded that our subjects had been on a diet with base-forming ash before starting the experiment and that the first 2 days were needed to adjust the excretion to the constant neutral diet. Because of this lag in the adaptation of the body to diets of different reactions, the values determined the third day are more representative of the excretion of acid in subjects on a neutral diet.

TABLE 2

Effect of papayas and guava juice on the acidity of the urine

SUBJECT	SUPPLEMENT	BASAL PERIOD	SUPPL PERIOD	DIFF.	BASAL PERIOD	SUPPL. PERIOD	DIFF.
		*p*H			*ml. N acid per 24 hr.*		
	Papaya						
A	500 gm.	5.8	5.9	+0.1	41	30	−11
B	750 gm.	5.2	5.7	+0.5	50	40	−10
C	750 gm.	6.0	6.5	+0.5	30	23	−7
	Guava Juice						
D	500 gm.	6.5	6.9	+0.4	25	24	−1
E	1000 gm.	6.4	6.5	+0.1	25	21	−4
F	1500 gm.	5.5	6.6	+1.1	54	26	−28

During the period with the fruit supplements the *p*H of the urine gradually rose and the titratable acidity dropped. Again a period of adjustment was noted. The values obtained the third day are therefore more representative of the excretion of acid in response to the neutral diet with the addition of these fruits. A summary of the results using data from the last day only of each period appears in Table 2.

In every case the addition of papaya or guava juice to the basal neutral diet caused a rise in the *p*H of the urine and a decrease in its titratable acidity. Ingesting as much as 750 gm. papaya or 1500 gm. guava juice resulted in a very definite lowering of urinary acidity.

SUMMARY AND CONCLUSIONS

Over a period of 3 days 6 subjects ate a diet calculated to be neutral. During the next 3 days, they consumed exactly the same diet, with the addition of either guava juice or papaya. The *p*H and total acidity of the urines were determined. In response to the neutral diet alone, the urinary *p*H fell slightly and the acidity tended to rise. The addition of guava juice or papaya caused the *p*H to rise slightly for every subject and there was a definite lowering of urinary acidity.

It may be concluded that the organic acids of papayas and guavas are completely oxidized in metabolism and that these two fruits produce a base-forming ash when ingested and metabolized by the human body.

REFERENCES

(1) Miller, C. D., Louis, L., and Yanazawa, K.: Vitamin values of Hawaiian-grown fruits and vegetables. Hawaii Agric. Exper. Sta. Progress Notes No. 36.

(2) Sherman, H. C.: Chemistry of Food and Nutrition, 6th ed. New York: The Macmillan Company, 1941.

(3) Fellers, C. R., Redmon, B. C., and Parrott, E. M.: Effect of cranberries on urinary acidity and blood alkali reserve. Massachusetts Agric. Exper. Sta. Contribution 171, 1932.

(4) Miller, C. D., and Robbins, R. C.: The nutritive value of papaya. Biochem. J. 31: 1, 1937.

Frozen Meats

In an address before the Twenty-third Annual Agricultural Outlook Conference, Washington, December 4, 1945, F. L. Thomsen, head, Division of Marketing and Transportation Research, Bureau of Agricultural Economics, USDA, made the following statements concerning the probable potential sales of frozen meats: "Many people seem to think of frozen foods in terms only of fruits and vegetables. That is probably a mistake. The greatest potential volume of frozen foods is in meats, fish, poultry, and other products. Frozen meats have certain definite advantages which seem to be frequently overlooked: (1) They are adaptable to standardization of weight and quality, so that the consumer who buys a package of branded frozen steak or roast, for example, can count on getting just about the same products day in and day out. (2) Frozen meats are much better adapted to self-service retailing than even prepackaged fresh meats, and this is very important in view of the trend towards self-service retail merchandising of food; (3) Frozen meats are adaptable to branding and advertising, which will furnish an incentive to packers; (4) Frozen meats permit a much more desirable distribution of the uneven seasonal production of meats.

"Probably the precutting and packaging of fresh meats will precede the advent of frozen meats in many chain stores and supermarkets, and some packers also may get into this field as a preliminary to freezing operations. Considerable research has been done by meat packers, manufacturers of packaging materials, and others, on problems involved in freezing, packaging, and storing meats. What is most needed now is a thorough test of consumer reactions to frozen meats, including different cuts and styles of pack."

The Antirachitic Value of Winter and Summer Milk Produced in Hawaii[1]

CAREY D. MILLER

Nutrition Department, Hawaii Agricultural Experiment Station, University of Hawaii, Honolulu

THE antirachitic properties of sunshine have been popularized to such a degree that many laymen appreciate the effects of the sun's rays upon bone calcification. Because the climate is mild in Hawaii and there seem to be long hours of sunshine, some people think that milk produced in the area should have a relatively high antirachitic value. Except for the short period during milking, dairy cows in Hawaii usually are kept in outdoor paddocks.

To answer the inquiries that have come to the Nutrition Department, experiments were planned to determine the vitamin D content of milk produced in Hawaii. When a test of milk from the university dairy showed the antirachitic potency to be no greater than that reported for average milk on the mainland United States (1), it was decided to test both summer and winter milk from two sources.

EXPERIMENTAL

Albino rats 28 to 30 days old, weighing 55 to 65 gm., were fed Steenbock's (2) rachitogenic diet No. 2965 for 21 days. Twenty-one-day and 31-day negative controls were taken from each litter. Supplements were fed for 8 days, then only the basal diet for 2 days. The rats were killed and the tibias removed for the line tests, graded according to the method of Bills *et al.* (3).

The curve of response (Fig. 1) had previously been established for this laboratory, using about 130 rats fed the U. S. P. reference cod liver oil as a source of vitamin D.

For the first tests, milk collected in February from the university dairy was used; for the three additional tests, milk obtained from two sources on the island of Oahu—milk No. 1 from the university dairy situated in one of the valleys where there are frequent clouds and showers, and milk No. 2 from a dairy near the seashore where the hours of sunshine per day are somewhat greater. The milk collected in February each year is referred to as winter milk; that in August, as summer milk.

As facilities were not available for preparing butter from the milk, cream was obtained by the use of a separator and the fat content of the cream and skim milk determined by the Babcock test. Mixed herd milk was used in every case. A few drops of formalin were added to the cream and skim milk which were kept in the dark at a temperature of about 34 to 35° F.

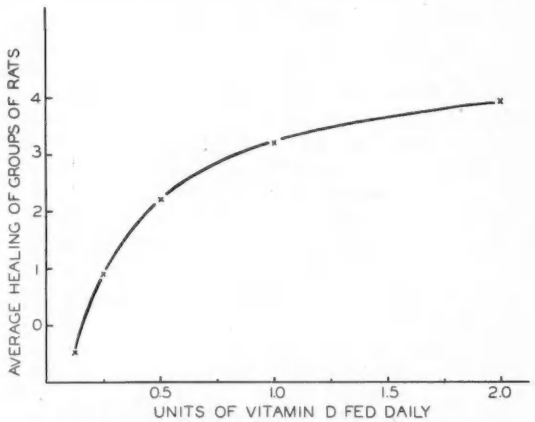


FIG. 1. *Curve of response relating healing of rickets in rats to International Units of vitamin D fed. (Each cross represents average healing for 20 rats.)*

Russell (4) has pointed out that feeding solids-not-fat in the form of skim milk, equivalent to the amount contained in the milk supplements, along with the reference oil, should furnish a more satisfactory reference standard than the oil alone. We

[1] Published with the approval of the Director, Hawaii Agricultural Experiment Station, as Technical Paper No. 128. Received for publication July 10, 1945.

adopted the somewhat simpler procedure of feeding all rats, except the negative controls, 5 ml. skim milk daily. For the cream supplements, the corresponding skim milk was used. For the positive controls fed the reference oil, skim milk from the two sources was fed on alternate days.

RESULTS AND DISCUSSION

The results of the feeding tests are summarized in Table 1 in which data for all negative controls are omitted, since they uniformly showed no healing of rickets.

As the two groups of rats fed the higher levels of cream in February 1943 showed complete healing of rickets, the results could not be used as a satisfactory measure of the vitamin D content of the milk. However, the group fed the lowest level showed a degree of healing that is considered a sensitive test. These results indicated a value of 22 units vitamin D per quart for the winter milk.

It may be noted that the rats fed the U. S. P. reference oil as the source of 0.5 I. U. vitamin D, plus 5 ml. skim milk, showed much better healing than rats of the same series fed the same source and amount of vitamin D without skim milk. However, rats fed 5 ml. skim milk as the only supplement showed no healing of rickets.

Milk collected in August 1943 from the two dairies had approximately the same vitamin D value—37 and 39 units per quart. Healing of rickets was so nearly complete when the cream was fed at the higher levels in each case that only the lower levels were used for evaluating the vitamin D content of these two samples of summer milk.

Since the summer milk of August 1943 contained approximately 70 per cent more vitamin D than the winter milk of that year, it seemed advisable to repeat the tests. Accordingly, winter and summer milks of 1944 were tested in a like manner.

The average vitamin D value per quart, based on the results obtained from feeding both levels of cream from winter milk No. 1 in 1944, is identical

TABLE 1

Results of feeding cream from winter and summer milk for its vitamin D value

SEASON	SUPPLEMENTS	NO. RATS	DEGREES OF HEALING	I. U. VITAMIN D IN MILK		TOTAL HR. SUNSHINE, PREVIOUS 3 MO.
			Average	per 100 gm.	per quart	
Feb. 1943	0.5 I. U. vitamin D*	10	2.2			666
	0.5 I. U. vitamin D* + 5 ml. skim milk	10	3.2			
	1.0 I. U. vitamin D* + " " " "	10	4.0			
	Milk No. 1					
	1.5 gm. cream (= 26 gm. milk) + 5 ml. skim milk	10	3.4	2.2	22	
	3.0 " " (= 52 " ") + " " " "	10	4.0			
	4.0 " " (= 69 " ") + " " " "	10	4.0			
Aug. 1943	0.5 I. U. vitamin D* + 5 ml. skim milk	10	3.1			910
	Milk No. 1					
	1.0 gm. cream (= 15 gm. milk) + 5 ml. skim milk	10	3.3	3.8	37	
	1.5 " " (= 23 " ") + " " " "	10	3.9			
	Milk No. 2					
	1.0 gm. cream (= 15 gm. milk) + 5 ml. skim milk	10	3.4	4.0	39	
	1.5 " " (= 23 " ") + " " " "	10	3.9			
Feb. 1944	0.4 I. U. vitamin D* + 5 ml. skim milk	10	3.2			741
	Milk No. 1					
	0.7 gm. cream (= 8.4 gm. milk) + 5 ml. skim milk	10	1.9	2.0	20	
	1.4 " " (= 16.8 " ") + " " " "	10	3.1	2.3	23	
	Milk No. 2					
	0.5 gm. cream (= 7.5 gm. milk) + 5 ml. skim milk	10	1.7	1.8	18	
	1.0 " " (= 15.0 " ") + " " " "	10	2.5	1.5	15	
Aug. 1944	0.4 I. U. vitamin D* + 5 ml. skim milk	10	2.9			861
	Milk No. 1					
	0.8 gm. cream (= 7.5 gm. milk)	10	1.4	(2.1)	(21)	
	1.6 " " (= 15.0 " ")	10	3.0	2.9	28	
	Milk No. 2					
	0.8 gm. cream (= 7.7 gm. milk)	10	2.3	3.6	35	
	1.6 " " (= 15.4 " ")	10	3.5	4.1	40	

* U. S. P. reference cod liver oil was used for all positive controls.

with that obtained for winter milk No. 1 in 1943. The low values for winter milk No. 2 for 1943 are believed to be in error because of the rancidity which developed in this cream before the feeding tests were completed.

The vitamin D values for the 1944 summer milk No. 2 are greater than for the winter milk and comparable to those for the 1943 summer milk. The value for milk No. 1 based on the higher level of the supplement is greater than for the winter milk of 1944 but is considerably lower than that for the previous summer. The results from the lower level of supplement for milk No. 1 indicate a value no greater than the winter milk and appear to be out of line with all the other results.

Data on the total hours of sunshine by months in Honolulu were obtained from the U. S. Weather Bureau located in the downtown area not far from the ocean. The total number of hours of sunshine reported for the 3 months prior to the collection of the milk is shown for each season in Table 1. In 1943, there were about 36 per cent more hours of sunshine during the 3 months prior to collection of the summer milk than during the 3 months prior to the collection of the winter milk. In 1944, a similar comparison shows about 16 per cent more hours of sunshine in the summer than in the winter months. The Weather Bureau reports for 1944 (5) include monthly averages of hours of sunshine for a period of 40 years. From these data, averages for the two 3-month periods just referred to have been calculated as follows: December, January and February—626 hours of sunshine; June, July and August—818 hours, or an increase of 30 per cent. Although effective ultraviolet rays may be received even when the sun is obscured by clouds, there is a general correlation between the amount of sunshine and the amount of ultraviolet light during any one period.

In Hawaii, the longest day in the year is nearly 13½ hours and the shortest almost 11 hours—less difference than in any place in the United States. Godfrey (6) found a seasonal variation in the ultraviolet light in Honolulu and stated that the altitude of the sun varies considerably in the winter and summer months at this latitude (21°18′). Detailed studies (7) have proved that the effectiveness of Arizona sunlight in curing rickets in rats is closely correlated with the altitude of the sun. Our findings that winter milk has a lower vitamin D content than summer milk in Hawaii appear to be in line with the known facts relating to sunshine and its antirachitic value.

The principal deduction that may be drawn from these experiments is that the vitamin D content of milk from cows in Hawaii appears to be very little better than that produced in temperate climates and therefore it cannot be depended upon to furnish adequate vitamin D for infants and growing children.

The National Research Council allowance for infants up to one year is 400 to 800 I. U. vitamin D. Jeans (8) has recommended that babies receive at least 350 I. U. vitamin D daily—a quantity which will not only prevent rickets but assure good bone and tooth calcification. He has also pointed out the need for vitamin D for normal calcification throughout the growth period. It is obvious that a quart of milk produced in Hawaii and containing 20 to 40 units vitamin D supplies only a small portion of the daily need for this vitamin, and that regular exposure to sunshine or some extra source of vitamin D is needed.

SUMMARY AND CONCLUSIONS

The antirachitic value of milk produced in Hawaii at two seasons of the year by two dairy herds has been determined by experiments with rats.

Winter milk was found to contain approximately 20 I. U. and summer milk approximately 35 I. U. vitamin D per quart—values similar to those found elsewhere.

Since infants need not less than 350 I. U. vitamin D to promote normal calcification of bones and teeth, the required amount of vitamin D obviously cannot be obtained from milk produced even in a sunny climate.

REFERENCES

(1) Hewston, E. M., and Marsh, R. L.: USDA Miscel. Pub. 505, 1942.
(2) Steenbock, H., and Black, A.: J. Biol. Chem. 64: 263, 1925.
(3) Bills, C. E., Honeywell, E. M., Wirick, A. M., and Nussmeier, M.: J. Biol. Chem. 90: 619, 1931.
(4) Russell, W. C.: J. A. O. A. C. 23: 345, 1940.
(5) Annual Meteorological Summary. U. S. Dept. of Commerce Weather Bureau Office, T. H., 1944.
(6) Godfrey, L. S.: J. Prevent. Med. 5: 1, 1931.
(7) Smith, M. C., Sayre, N., and Blanchard, E.: Univ. of Arizona Agric. Exper. Sta. Tech. Bull. 90, 1941.
(8) Jeans, P. C.: J. A. M. A. 120: 913, 1942.

Driving an Automobile While Under the Influence of Insulin

In 1930 a law was enacted making it an offense to drive a car while under the influence of drink or drugs to such an extent as to be incapable of proper control of the vehicle. The drugs concerned in the legislation were chiefly morphine and cocaine. The possibility of a diabetic motorist being charged with the offense of driving while under the influence of insulin was not considered. Such a case has occurred, and the man was convicted. A fine of $10 was imposed, and his driving license was suspended for a year. The man had not eaten his normal midday meal on the day of the accident. During the afternoon he felt tingling in the fingers and took a lump of sugar. He felt tired and decided to drive home. He thought that he drove normally and did not remember the accident. An appeal was made against the sentence. His lawyer argued that there was no proof of the unlawful influence of a drug. The motorist was right in taking insulin on medical advice and was not under the influence of the drug but of insufficient food. Medical evidence was given that insulin is a drug and the judge held that the motorist had rightly been convicted. As he was entirely blameless in the matter, he did not deserve punishment. The judge therefore dismissed the case under the Probation of Offenders Act and restored the license.—*Foreign Letters, J. A. M. A. 130: 169, 1946.*

Riboflavin and Thiamin Loss in Cooking Eggs[1]

OLOF E. STAMBERG and CHARLIE F. PETERSEN[2]

Departments of Agricultural Chemistry and Poultry Husbandry, University of Idaho, Moscow

VERY little information is available in the literature on the loss of riboflavin and thiamin in the preparation or cooking of eggs by the usual methods. In studying the loss of B vitamins in numerous foods due to cooking, two tests on scrambled eggs cooked in an open pan resulted in a 48 and 22 per cent loss of riboflavin, while in one test on scrambled eggs in a covered pan there was no loss of this vitamin (1). This indicates that photolysis of riboflavin must have been a factor when an uncovered pan was used. The loss of riboflavin in foods due to light has been noted (2) and in the case of milk has been clearly demonstrated (3, 4).

Others (5) have reported the thiamin loss in cooking of various foods; eggs lost 29 per cent thiamin on boiling and 9 per cent when scrambled, on the basis of an original thiamin content of 1.12 and 1.03 mcg. per gram, respectively. Apparently only these two determinations were made.

The riboflavin content of eggs has been reported by several workers as varying from 2 to 6 mcg. per gram (6). Their work also indicated that the riboflavin content of eggs depended upon the amount in the diet of laying hens and that the content remained quite constant when there was no change in diet. Others (7) presented some evidence to show that the riboflavin content of eggs varied from hen to hen, but that each hen produced eggs of fairly constant riboflavin content.

The work just reviewed indicates that the riboflavin content is fairly uniform for eggs produced by individual hens on a constant diet. In studying the vitamin losses of eggs by frying, boiling, or poaching, it is not possible of course to determine the content before and after preparation by using the same eggs. Thus for this study consecutive eggs obtained from hens on a constant diet were collected and analyzed raw and after various cooking methods and the losses as based on numerous eggs from several hens were averaged. No study has been published showing that the thiamin content of eggs from hens fed a uniform diet remains quite constant, but it was assumed that this might be the case.

[1] Published with the approval of the Director of the Idaho Agricultural Experiment Station as Research Paper No. 239. Received for publication April 9, 1945.

[2] With the technical assistance of Julein Paulson, senior student in home economics.

PROCEDURE

Several Single Comb White Leghorn pullets housed in individual laying cages were selected for the experiment, and fed a constant diet of 15 per cent bran, 20 per cent oats, 10 per cent wheat, 15 per cent corn, 10 per cent shorts, 7 per cent dehydrated alfalfa, 5 per cent fish meal, 5 per cent meat meal, 5 per cent dry milk solids, 7 per cent combined of oyster shell, bone meal, grit, salt, and vitamins A and D concentrate, and, in addition, a 1 per cent riboflavin concentrate with a guaranteed content of 250 mcg. per gram. The hens were on this diet for 1 month before eggs were used for this study. Eggs from 4 hens producing eggs of fairly high riboflavin content were finally selected.

The method for the determination of riboflavin was essentially that described elsewhere (7). In the case of raw eggs the filtrates were used directly, but for cooked eggs the chloroform procedure described by them was used. The net weight of the egg, in the neighborhood of 50 to 55 gm., was used in the calculation. The whole egg was mixed in a Waring Blendor with 125 ml. 0.1 N sulfuric acid—raw eggs for 1 min. and cooked eggs for 2 to 3 min. The mixture was rinsed with some acid into a beaker and made up to 200 gm. After thorough stirring, an aliquot of 50 gm., equivalent to one fourth the egg, was mixed in a 300-ml. amber Erlenmeyer flask with 50 ml. additional acid and heated in a steam oven 15 min. After cooling, 40 ml. water and 25 ml. buffer were added and then 0.5 gm. clarase enzyme. After digestion overnight the material was made up to a volume of 200 ml., thoroughly mixed and then filtered. Duplicate

determinations of aliquots from the same egg were made and the vitamin content calculated to mcg. per gm., based on the net weight of the egg. A complete blank determination, including the enzyme, was made and corrected for in the calculation.

The thiamin content was determined by the thiochrome method described by Conner and Straub (8). A Coleman photofluorometer was used for both the riboflavin and the thiamin determinations.

The eggs were placed in boiling tap water and allowed to boil for exactly 10 min., after which they were cooled under running tap water. The fried eggs were prepared by frying in a small pan with some hydrogenated shortening and turned over. The total frying time was about 4 min., at which time the yolks were quite solid. The poaching was done in tap water, requiring about 3 to 4 min., and a small amount of egg white was lost in the poaching water. The scrambled eggs were prepared in a small frying pan using individual eggs with about 15 ml. water instead of milk. From 4 to 5 min. cooking time was required.

All cooking was done in daylight in a well-lighted room. About 10 to 15 min. after cooking, each egg was transferred to the Waring Blendor bowl.

TABLE 1

Riboflavin and thiamin content of raw and prepared eggs

TREATMENT	RIBOFLAVIN CONTENT				THIAMIN CONTENT			
	Hen No. 4	No. 5	No. 8	No. 12	No. 4	No. 5	No. 8	No. 12
	mcg./gm.	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*	*mcg./gm.*
Raw	5.03	5.94	5.50	5.82	1.37	1.25	1.19	1.15
Raw	5.39	6.34	4.97	6.18	1.27	1.22	1.08	1.06
Boiled	5.16	5.71	5.19	5.93	1.12	1.10	0.98	0.92
Boiled	5.24	5.80	5.17	6.07	1.23	1.20	0.82	0.93
Raw	5.42	6.27	5.10	6.16	1.46	1.32	1.13	1.22
Fried	5.13	5.71	4.75	5.79	1.04	1.02	0.91	0.99
Fried	4.80	6.12	4.68	6.15	1.19	1.10	0.96	1.07
Raw	5.59	5.86	5.23	5.72	1.47	1.41	1.22	1.30
Poached	4.47	5.75	4.53	5.04	1.12	1.14	0.78	0.75
Poached	4.97	5.55	3.96	4.65	1.17	1.07	0.99	0.83
Raw	6.00	6.90	5.15	6.61	1.18	1.14	1.08	1.03
Raw	5.36	6.85	4.53	6.69	1.23	1.07	0.94	1.00
Scrambled	5.28	6.68	4.94	5.91	1.06	1.09	1.02	0.90
Scrambled	6.13	5.47	5.58	5.95	1.15	0.97	1.01	1.01
Raw	5.89	6.60	5.70	5.43	1.37	1.28	1.04	1.07
Raw	6.29	6.78	5.62	5.73	1.34	1.33	1.08	1.11
Av. raw	5.62	6.44	5.23	6.04	1.34	1.25	1.10	1.12
Av. prepared	5.15	5.85	4.85	5.69	1.14	1.09	0.93	0.93
	%	%	%	%	%	%	%	%
Percentage loss	8.4	9.2	7.3	5.8	14.9	12.8	15.5	16.9
Av. percentage loss		7.7				15.0		

TABLE 2

Average percentage loss for the various methods of preparation

	NUMBER EGGS USED	RIBOFLAVIN		THIAMIN	
		Av. content*	Loss	Av. content*	Loss
		mcg./gm.	%	*mcg./gm.*	%
Raw	32	5.83		1.20	
Boiled	8	5.53	5.1	1.04	13.3
Fried	8	5.39	7.5	1.04	13.3
Poached	8	4.87	16.5	0.98	18.3
Scrambled	8	5.74	1.5	1.03	14.2
All prepared	32	5.38	7.7	1.02	15.0

* Representing averages of figures for eggs from each of 4 hens (*see* Table 1).

All subsequent operations were in a dark room used for vitamin analyses and especially for riboflavin.

RESULTS

The figures in Table 1 are for eggs from 4 different hens (designated as nos. 4, 5, 8, and 12) and represent results on consecutive eggs (laid in the order listed) except for an occasional breakage. Thus raw eggs were analyzed at intervals at the beginning and end of the test period and also between each cooking method. Riboflavin and thiamin values in Table 1 were determined on the same eggs. The riboflavin content of the eggs used was higher than that of ordinary market eggs due to the high riboflavin level of the feed. It was thought that cooking losses could be better determined on the higher vitamin eggs.

The data in Table 1 indicate that each hen produced eggs fairly constant in vitamin content although the variations were greater than expected. The percentage losses for each method of cooking as shown in Table 2 indicate a greater variation for riboflavin than for thiamin. There was some loss of egg white in the water used in cooking poached eggs. This may be the reason for the large riboflavin loss, since the net weight used for calculations was the weight of the whole egg less the weight of the shell. Others (9, 10) found that all of the thiamin of the egg is in the yolk, which perhaps explains why thiamin was not lost to a greater extent in poaching as compared to the other methods of cooking. The riboflavin loss in scrambled eggs was the lowest.

The percentage loss values (Table 1) vary in eggs from different hens. The data in Table 2 indicate an appreciable variation in riboflavin loss due to the method of cooking, whereas the thiamin loss, although greater, was more uniform.

The variations in individual eggs prepared in the same manner are obviously due mainly to variation in the original vitamin content of eggs from the same hen, and also to differences in preparation. Only the boiling of eggs could be carefully controlled and it is interesting to note (Table 1) that the boiled eggs showed the least variation.

The average values warrant the conclusion that small amounts of riboflavin and thiamin are lost in cooking by usual methods. The average loss in our experiments was 7.7 and 15.0 per cent for riboflavin and thiamin, respectively. The actual amount of loss per egg in cooking, of course, would be higher for riboflavin than for thiamin because of the higher riboflavin content.

SUMMARY

Eggs from hens routinely fed a high riboflavin diet were analyzed for riboflavin and thiamin. Analyses of 32 raw and 32 prepared eggs showed an average cooking loss of 7.7 per cent for riboflavin and 15.0 per cent for thiamin. Poached eggs showed appreciably higher loss of riboflavin than boiled, fried, or scrambled, probably due to loss of material in the poaching water. Scrambled eggs lost the least riboflavin. The thiamin loss was quite uniform with all methods of preparation used.

REFERENCES

(1) CHELDELIN, V. H., WOODS, A. M., AND WILLIAMS, R. J.: Losses of B vitamins due to cooking of foods. J. Nutrition 26: 477, 1943.
(2) WILLIAMS, R. R., AND CHELDELIN, V. H.: Destruction of riboflavin by light. Science 96: 22, 1943.
(3) STAMBERG, O. E., AND THEOPHILUS, D. R.: Loss of riboflavin in milk due to sunlight. The Milk Dealer 33: 32, 1944.
(4) *Idem:* Photolysis of riboflavin in milk. J. Dairy Sci. 28: 269, 1945.
(5) LANE, R. L., JOHNSON, E., AND WILLIAMS, R. R.: Studies of the average American diet. J. Nutrition 23: 612, 1942.
(6) NORRIS, L. C., AND BAUERNFEIND, J. C.: Effect of level of dietary riboflavin upon quantity stored in eggs and rate of storage. Food Research 5: 521, 1940.
(7) PETERSON, W. J., DEARSTYNE, R. S., COMSTOCK, R. E., AND WELDON, V.: The fluorometric determination of riboflavin in eggs. Presented before the Division of Biological Chemistry, Am. Chem. Soc., New York, 1944.
(8) CONNER, R. T., AND STRAUB, G. J.: Indust. & Engin. Chem. Anal. Ed. 13: 385, 1941.
(9) PYKE, M. A.: Biochem. J. 31: 1958, 1937.
(10) LEONG, P. C.: Vitamin B_1 content of foods. J. Malaya Branch British Med. A. 4: 66, 1940.

BRITISH AND AMERICAN DIETS COMPARED

AN IMPORTANT STATEMENT comparing food consumption in Britain, Canada and the United States has been issued by the Ministry of Food. It should be realized that the food conditions existing during the war continue in Britain, where aid to Europe has impeded recovery. This year the consumption of food in Britain is lower than in the two North American countries by about 5 per cent for fats, 15 per cent for sugar, 25 per cent for meat and milk, 40 per cent for eggs, 40 to 60 per cent for fruit and 90 per cent for poultry. On the other hand, consumption in Britain exceeds that of Canada and the United States by about 20 per cent for grain products, 50 to 100 per cent for potatoes and about 300 per cent for fish. Vegetable consumption is lowest in Canada and highest in the United States. The principal change in the British diet due to the war is a great reduction in meat; the war ration of the quantity of meat which can be bought weekly for 28 cents continues. This amounts to only about ¾ pound of meat weekly. The great increase in fish consumption is compensatory. Vital statistics have actually improved during the war. The people apparently have not suffered from the severe rationing which dislocated their ordinary food habits. Bread was never rationed, and sufficient food could be obtained althqugh not the food desired.—*Foreign Letters J.A.M.A. 130: 101, 1946.*

Composition and Nutritive Value of Mushroom Protein[1]

WILLIAM H. FITZPATRICK, WILLIAM B. ESSELEN, Jr., and EDITH WEIR

Food Technology Department, Massachusetts State College, Amherst

ALTHOUGH mushrooms have long been considered a tasty and flavorful food, little is known regarding their nutritive value. Since most reference tables on food composition indicate that mushrooms have little or no value as a food, the purpose of this investigation was twofold: to determine the nutritive value of the mushroom protein, and the number of essential amino acids present in the commercially cultivated mushroom, *Agaricus campestris*.

REVIEW OF LITERATURE

Saltet (1) employed human subjects in testing the digestibility of mushroom nitrogen, the results of which indicated that 69 per cent of the total nitrogen of *Agaricus campestris* existed in the form of a protein. Of this, only 25 per cent was not digested *in vitro* by successive treatments with gastric and pancreatic extracts. It was therefore concluded that 50 per cent of the total nitrogen present in the mushroom was in the form of a digestible protein. Mendel (2) reported data which showed that mushrooms contained 5 per cent protein and expressed the opinion that they would be a good source of protein. The investigations of Konig (3) indicated that the nitrogen content of the mushrooms was slightly more than 5 per cent. He likewise expressed the opinion that mushrooms would be an excellent source of protein.

While working with the basic extractives of *Agaricus campestris*, Kutscher (4) obtained the following substances in small amounts from a commercial water extract: arginine, choline, betaine, and one hitherto unknown substance which was isolated as the aurate. The empirical formula of the new compound agreed with that of histidine with three substituted methyl groups. Winterstein (5) made alcoholic extracts of dry mushrooms, which, upon analysis, yielded lecithin, trimethylhistidine, adenine, and small amounts of guanine and hypoxanthine. The arginine fraction contained the base which had been previously reported by Kutscher (4). The proteins of the mushroom yielded glycine, alanine, leucine, valine, proline, phenylalanine, and aspartic and glutamic acids. Baglioni (6) found that the soluble part of mushrooms was composed chiefly of free amino acids, leucine and tyrosine, with small quantities of urea, purine bases, asparagine, and glutamine.

Skinner (7) investigated the coefficient of digestibility of the protein of *Agaricus campestris*, using albino rats, and found it to be 71 per cent or in fairly close agreement with the findings of Saltet (1). However, these data were not in agreement with those of Morner (8) who reported that only 50 per cent of the total nitrogen of mushrooms was capable of being digested *in vitro*.

According to Rettew (9), the mushroom has the same approximate caloric value as fresh Lima beans, onions, and apples. The ash content of the cultivated mushroom is higher than that of the other vegetables. Mushrooms contain a fair amount of calcium and manganese, a large quantity of potassium and phosphorus, and a moderate quantity of sulfur. Other data show that mushrooms contain an exceptionally large quantity of copper, also zinc and iron.

EXPERIMENTAL

Animal Feeding Tests. Several animal feeding experiments were carried out according to the paired-feeding method of Mitchell (10). Purified casein was used as the standard animal protein. A third source of protein, soybean meal, was used so that the nutritive value of the mushroom protein might be compared with both an animal and a

[1] Contribution No. 521, Massachusetts Agricultural Experiment Station. Received for publication April 19, 1945. The authors acknowledge the generous cooperation and assistance of Professors Walter S. Ritchie and Emmett Bennett of the Department of Chemistry, throughout the investigation.

vegetable protein. Table 1 gives the composition of the diets used in all animal feeding experiments. The level of protein fed in the first experiment was 8 per cent. The rats fed the casein diet gained an average of 10.8 gm. in the 6-week feeding period, while those fed soybean meal and those fed mushrooms gained 8.0 and 3.7 gm., respectively.

A second feeding test was conducted in order to investigate the nutritive value of the mushroom at a 15 per cent protein level. Rats fed 15 per cent casein had an average gain in weight for the 6 weeks of 21.4 gm., while those on 15 per cent mushroom protein gained 10.4 gm. in 6 weeks.

Because Morner (8) had found that in *Agaricus campestris* only 66 per cent of the total nitrogen was in the form of a protein, a third feeding experiment was undertaken. Three isocaloric diets were made up which contained 8 per cent casein, soybean, and mushroom protein. To compensate for the 33 per cent of nonprotein nitrogen, an extra 33 per cent mushroom nitrogen was added (as shown by Morner and in the present investigation), which is another way of expressing the fact that the protein level of the mushroom diet was at an 8 per cent level. The rats on the casein diet gained 14.5 gm. in the 6-week feeding period, those on soybean 12 gm., and those on mushroom 6.1 gm. This experiment indicated that the true protein in the mushroom produced a growth in albino rats equal to slightly less than one half that produced by casein and about two thirds that produced by soybean.

From the results of the paired-feeding experiments the relative protein qualities were computed (Table 1). Assigning an arbitrary value of 100 to casein, the relative values for mushroom protein and soybean meal were 32.6 and 100.5, respectively, when fed at an 8 per cent level. When the level was increased to 15 per cent, the relative protein quality of mushroom protein increased to 56.6 per cent. When the nonprotein nitrogen was compensated, using the value of 100 for casein, values of 90.3 and 32.5 were obtained for soybean meal and mushroom protein, respectively.

The data obtained in the animal feeding experiments indicate that the mushroom protein contained all the amino acids essential for the rat. If this were not true the animals would not have grown at all but would probably have died within the 6-week period. The fact that the rats on the mushroom diet did not gain as much weight as those on the control diet indicated that the essential amino acids, although present, were probably in low concentrations in the case of certain individual acids. As is shown later in this paper the tryptophane content of mushroom protein was found to be particularly low.

Another problem encountered in the feeding tests was the fact that the diets containing mushroom were somewhat unpalatable to the rats. Thus the low food intake of the group receiving mushroom protein restricted the food intake of the control animals, with the result that they did not grow so well as might have been expected. The qualitative chemical tests and quantitative microbiological tests for amino acids discussed later bear out the fact that all the essential amino acids are present in mushroom protein, at least in small amounts.

TABLE 1

Composition of diets and results of protein growth experiments

	8% CASEIN*	8% SOYBEAN PROTEIN*	8% MUSHROOM PROTEIN*	15% MUSHROOM PROTEIN**	15% CASEIN**	12% MUSHROOM PROTEIN†
	gm.	*gm.*	*gm.*	*gm.*	*gm.*	*gm.*
Casein	8.0				15.0	
Mushroom (dehydrated)			22.0	41.25		33.3
Soybean meal		17.5				
Yeast	5.0	5.0	5.0	5.0	5.0	5.0
Salt mixture	3.0	3.0	3.0	3.0	3.0	3.0
Cod liver oil	2.0	2.0	2.0	2.0	2.0	2.0
Agar	1.0	1.0	1.0	1.0	1.0	1.0
Starch	72.0	61.5	54.0	32.75	67.0	45.0
Butter fat	9.0	10.0	13.0	15.0	7.0	11.7
Calories per 100 gm.	418.6	420.5	420.5	420.0	419.3	420.5
Average daily intake	3.62	3.62	3.63	3.36	3.35	3.21
Average gain in body weight	10.8	8	3.7	10.4	21.4	6.1
Relative protein quality	100.00	100.5	32.6	56.5	100.00	32.5††

* First experiment. Fed to 7 rats for 6-week period.

** Second experiment. Fed to 5 rats for 6-week period.

† Third experiment. Protein considered as N × 6.25. Two thirds of the nitrogen is considered to be in form of protein.

†† Compared with 90.3 for soybean meal.

DISTRIBUTION OF NITROGEN

The various nitrogen fractions on the mushroom were extracted with each of the following: water, salt solution, acid, alkali, and alcohol, in order to determine their solubility. The initial *p*H value of the various solvents was determined by means of a Beckman *p*H meter. Into 500 ml. of the various solvents was placed 250 gm. fresh mushrooms, the mixture ground up thoroughly for 10 min. in a Waring Blendor, and then centrifuged at 5000 r.p.m. for 10 min. in order to throw down the cellular material. The clear solution was decanted through a layer of glass wool and the residue discarded. Each of these 5 extracts was then subjected to four different nitrogen determinations: Kjeldahl for total nitrogen, ammonia nitrogen, amide nitrogen, and Van Slyke for amino nitrogen. These data, summarized in Table 2, indicate that: about two thirds of the total nitrogen of *Agaricus campestris* was soluble in the 5 solvents; the amide nitrogen and amino nitrogen seemed to be equally soluble in all solvents; since very small quantities of ammonia, amide, and amino nitrogen were found present in these solvents, the major portion of this soluble nitrogen must have been in the form of protein.

TABLE 2

Content of various soluble forms of nitrogen in percentage of total nitrogen

SOLVENT	% OF TOTAL AS SOL. N	% OF TOTAL AS AMMONIA N	% OF TOTAL AS AMIDE N	% OF TOTAL AS AMINO N
Water	60.0	0.006	0.167	0.28
10% salt	88.6	0.003	0.183	0.33
Acid (*p*H 4.05)	64.0	0.007	0.107	0.27
Alkali (*p*H 10.0)	80.0	0.013	0.167	0.28
80% alcohol	51.0	0.000	0.142	0.10

TRUE PROTEIN

After having obtained a fairly accurate picture of the distribution of the soluble nitrogen content, the true protein was determined by extracting 250 gm. fresh *Agaricus campestris* in a Waring Blendor with sufficient 95 per cent ethanol to keep the final concentration at 80 per cent. The mixture was heated to 80°C. in order to denature the protein. Four 50 ml. aliquots were centrifuged for 20 min. at 5000 r.p.m. They were then washed with 100 ml. 95 per cent alcohol and with boiling water until no further color was obtainable in the filtrate. A Kjeldahl determination on this residue yielded 2.19 per cent (N × 6.25) true protein, and a similar determination on fresh mushrooms yielded 3.5 per cent protein (N × 6.25). This amount of protein compared favorably with that found in most of the vegetables. From these data it has been computed that about 63 per cent of the total nitrogen was in the form of protein. This is in close agreement with the work of Morner (8).

ISO-ELECTRIC POINT

The method of Lugg (11), used in extracting pure protein from the cells, involved the cytolysis of the mushrooms in the ether-water solution and the subsequent expression of the protein in a Carver Hand Press at 12,000 lb. per square inch. The expressed fluid was then placed in small test tubes and dilute acetic acid added. Within the *p*H range of 5.08 to 3.12, flocculation was observed, which indicated that the iso-electric range of the protein "system" was somewhere between these limits. The term "system" was used to indicate that there were probably several individual proteins. A second series of tubes was set up and the *p*H values were adjusted between the limits of 4.5 and 3.5. Flocculation was observed in all tubes to the same extent, with no single tube showing any greater flocculation than any other. A more accurate check on the value indicated that the iso-electric range was between 4.47 and 3.42.

The nitrogen content of the protein was determined after the protein had been expressed out of the mushrooms, coagulated by heat, filtered and washed several times with alcohol and water, then dried in an oven at 85°C. for several hours. After being corrected for ash, the nitrogen content of the purified protein was found to be 11.79 per cent.

The protein was ashed in a muffle furnace and then subjected to qualitative chemical analysis. After a portion of the ash was oxidized with boiling nitric acid the test for ferric ions was found to be positive. This ash was then examined spectrographically and the resulting lines were identical with those obtained from a pure sample of iron. The major lines were observed at 4070, 4063, 4045, and 3800 Angstrom units.

ESSENTIAL AMINO ACIDS

Among the various nitrogenous compounds occurring in proteinaceous material, the essential amino acids occupy the most important position in nutrition. Since growth of animals depends to a large extent on the number of essential amino acids present, a better understanding of the nutritive value of the mushroom protein was possible from amino acid determinations and feeding trials than from feeding trials alone. Samples of the mushroom protein were analyzed qualitatively for the essential amino acids as follows:

Histidine, Arginine, and Lysine were separated from each other and from the nonbasic amino acids by precipitating histidine silver at *p*H 7.4, arginine silver between *p*H 8.5 and 14, and lysine as its phosphotungstate. When the first precipitate was subjected to the bromination test of Kapeller-Adler (12), the purple color specific for histidine

was observed. Another portion of the precipitate was added to a diazonium salt and the red color specific for histidine was observed. These two positive tests were considered evidence of the presence of histidine. Parallel technique with casein as a control gave positive reactions for histidine.

Arginine silver was precipitated by the addition of hot baryta at *p*H 12 and its presence confirmed by the method of Sakaguchi (13). Parallel technique with casein also yielded a positive reaction.

The strong alkaline filtrate from the arginine silver precipitate was acidified and to it was added phospho-24-tungstic acid. Lysine is unique in that it has two amino groups, one in the alpha and one in the epsilon position. Since these amino groups have different rates of reaction with HNO_2, their nitrogen may be liberated separately and measured volumetrically. Two samples thought to contain lysine were analyzed in the Van Slyke apparatus, one for 5 min., the other for 20 min. The first sample yielded 2.1 ml. of nitrogen gas, the second 3.9 ml. These data were taken as evidence of the presence of lysine.

Tests for the presence of *Methionine* were made by the method of McCarthy (14) and that of Kolb (15). Negative results were obtained in both cases.

Phenylalanine and Tryptophane were determined following an alkaline hydrolysis, since an acid hydrolysis would destroy tryptophane. While the hydrolysate was still hot, it was neutralized with 7N H_2SO_4.

A 25-ml. aliquot of neutralized hydrolysate was brought to dryness on the steam bath. When cool, 2 ml. nitrating mixture (10 per cent KNO_3 in concentrated H_2SO_4) was added to the solution and warmed on the steam bath for 20 min. The solution was thoroughly cooled in ice water at 0° and when cold, 2.5 ml. 30 per cent $NH_2OH \cdot HCl$ was added. The solution was again cooled in ice water for exactly 1 min. and then diluted to a 25 ml. mark with ice-cold NH_4OH. The appearance of a purple color which developed at the interface of the 2 liquids indicated the presence of phenylalanine. This reaction is referred to as the Kapeller-Adler reaction (16). A parallel determination with casein also gave a positive indication.

Many tests have been devised for the detection of tryptophane. According to Holm (17), tryptophane will give color reactions in the presence of aromatic aldehydes. A 25-ml. aliquot of the alkali hydrolysate of mushrooms was placed in a 100-ml. glass-stoppered cylinder and to this was added 10 ml. 10 per cent p-dimethylaminobenzyaldehyde in concentrated H_2SO_4. The characteristic red color due to tryptophane was masked by a reddish-brown color, probably due to other substances in the mushroom. Ten ml. butyl alcohol was added and the solution shaken gently several times. The butyl alcohol extracted the brown color and then the deep red color due to tryptophane was clearly visible. A parallel determination with casein also gave a positive reaction.

Threonine and Serine react quantitatively and almost instantly with HIO_4 to yield CH_3CHO and HCHO. The method of Shinn (18) consists of the absorption of the selectively vaporized CH_3CHO in standard $NaHSO_3$. The results of this determination indicated the presence of threonine in the mushroom protein in an amount slightly greater than 1 per cent. Parallel technique with casein also gave a positive test and the amount of threonine found was about 2 per cent.

Leucine, Isoleucine, and Valine. The method of Block (19) indicated that leucine, isoleucine, and valine were missing or, if present, in amounts too small to be demonstrable by this method. As a check, a method proposed by Sanchez (20) was used and gave a positive test for leucine.

AMINO ACID CONTENT OF MUSHROOMS BY MICROBIOLOGICAL TECHNIQUE

Fresh mushrooms were washed, sliced, completely dried at 60°C., and then ground in a Wiley mill to pass a 40-mesh sieve.

Preparation of Hydrolysate. The dried mushrooms were hydrolyzed, prior to assay, in a manner similar to that described by others (21). An acid hydrolysate was used in the case of arginine, isoleucine, leucine, methionine and valine; an alkaline hydrolysate, for tryptophane.

Methods. The microbiological method of Hutchings, *et al.* (22) was followed in the present investigation. *Lactobacillus arabinosus* 17-5 was used as the test organism. The composition of the assay made up from stock solution of the different ingredients, is indicated in Table 3.

In addition, 2.0 mg. of each of the following amino acids, except for the one under test, were present in each 10.0 ml. complete media: dl-alanine, l-arginine, l-aspartic acid, l-cystine, glycine, l(+)glutamic acid, l-histidine, l-hydroxyproline, dl-isoleucine, l-leucine, l-lysine (HCl), dl-methionine, norleucine, dl-phenylalanine, l-proline, dl-serine, dl-threonine, l-tryptophane, l-tyrosine and dl-valine.

The medium was made up to double strength and 5.0 ml. added to each test tube in setting up an assay. In carrying out a test the tubes were incubated 72 hr. at 37.5°C. and their contents then titrated with 0.1 N sodium hydroxide, using bromthymolblue indicator. A reference curve of response based on acid production by *Lactobacillus arabinosus* 17-5 was plotted in each case and the amino acid content of the test sample calculated in the usual manner. Five levels of the hydrolysate were used in each case. The results are summarized in Table 4. In most cases several different hydroly-

sates of the dried mushroom were assayed and reasonably good checks obtained.

Attempts were made to obtain assay curves of response in testing for histidine, lysine, phenylalanine and threonine, but the results were unsatisfactory.

Previous work has shown that when certain of the amino acids are found in naturally occurring proteins in foods they may be in combination with carbohydrate. These protein-carbohydrate linkages are not always broken down by acid or alkali hydrolysis. In order to find out whether such a situation might exist in the case of mushrooms, samples of the dried product were treated with diastase prior to hydrolysis. However, the results obtained were not significantly different from those with the straight hydrolysates.

Discussion. Although the results of the animal feeding tests indicate the presence of all of the essential amino acids in mushroom protein, taken by themselves they may be open to question. However, the chemical and microbiological tests bear out the fact that these amino acids are present, even though in small amounts in some cases. Positive chemical tests were not obtained for valine, isoleucine and methionine but their presence was demonstrated by the microbiological tests.

TABLE 3

MATERIALS	AMOUNT IN 10 ML. COMPLETE MEDIUM	MATERIAL	AMOUNT IN 10 ML. COMPLETE MEDIUM
Vitamin		*Salts A*	
Thiamin hydrochloride	1.00 mg.	KH_2PO_4	5.00 mg.
Biotin	0.05	K_2HPO_4	5.00
Folic acid	0.10		
Calcium pantothenate	2.00		
		Salts B	
Nicotinic acid	2.00	Mg_2SO_4	2.00
Riboflavin	2.00	NaCl	0.01
Pyridoxine hydrochloride	4.00	$FeSO_4$	0.01
		$MnSO_4$	0.067 mg.
Purines			
Guanine hydrochloride	50.00 mg.	Sodium acetate	60.00 mg.
Adenine sulfate	50.00		
Xanthine	50.00	Glucose (anhydrous)	0.1
Uracil	50.00		

TABLE 4

Amino acid content of mushrooms as determined by microbiological methods

AMINO ACID	NO. OF DETERMINATIONS	RANGE OF REFERENCE CURVE	LEVELS OF DRIED MUSHROOMS	MEAN AMINO ACID PER 1 GM. DRIED MUSHROOMS	AMINO ACID CONTENT PER 100 GM. FRESH WEIGHT BASIS
		mg.	*mg.*	*mg.*	*mg.*
l-arginine	3	0.0–0.6	0.4–1.2	19.35 ± .15	203.17
dl-isoleucine	8	0.0–0.1	0.4–1.2	43.70 ±4.10	458.85
l-leucine	6	0.0–0.6	0.4–1.2	23.05 ±3.15	242.02
dl-methionine	3	0.0–0.05	0.4–1.2	13.75 ±3.15	144.37
l-tryptophane	4	0.0–0.1	2.0–8.0	0.483 ±0.139	5.07
dl-valine	5	0.0–0.06	0.4–1.2	31.05 ±0.95	326.02

SUMMARY AND CONCLUSIONS

1. When mushrooms (*Agaricus campestris*) were fed as the sole source of protein to albino rats, they survived and grew, although not to the same extent as did rats fed casein or soybean meal. From these animal feeding experiments it was concluded that all the essential amino acids are present in mushrooms, but in lower concentrations than in casein.

2. Qualitative chemical analysis of mushrooms gave positive tests for the following essential amino acids: phenylalanine, histidine, leucine, lysine, arginine, tryptophane, and threonine. The essential amino acids which failed to give positive tests were: valine, isoleucine, and methionine. However, the presence of these three amino acids was indicated by the animal feeding tests and confirmed by microbiological assay methods.

3. Quantitative data on the amino acid content of mushrooms obtained by microbiological assay methods showed that mushrooms contain approximately 203, 458, 242, 144, 5, and 326 mg., respectively, of arginine, isoleucine, leucine, methionine, tryptophane and valine per 100 gm. on a fresh weight basis.

4. The total nitrogen content of mushrooms was about 0.5 per cent, of which 63 per cent was in the form of protein. Purified mushroom protein had a nitrogen content of 11.79 per cent.

5. It is concluded that fresh mushrooms (*Agaricus campestris*) contain approximately 2.67 per cent of protein, and that their protein content compares favorably with that of many fresh vegetables.

REFERENCES

(1) SALTET, R. H.: Arch. Hyg. 3: 443, 1885.
(2) MENDEL, J. B.: Am. J. Physiol. 1: 225, 1898.
(3) KONIG, J.: Chemie der menschlichen nahrungs- und genussmittel. I. B. 809 ff., Berlin, 1903.
(4) KUTSCHER, F.: Zentr. Physiol. Chem. 24: 775, 1911. (Chem. Abst. 5, 899).
(5) WINTERSTEIN, E., AND REUTER, C.: Centr. Bakt. Parasitenk, II. Abt. 34: 566, 1912. (Chem. Abst. 6, 3279).
(6) BAGLIONI, S., AND SETTING, L.: Atti. accad. Lincei (6) 6, 377, 1927. (Chem. Abst. 22, 1198).
(7) SKINNER, J. T., PETERSON, W. H., AND STEENBOCK, H.: Biochem. Ztschr. 267: 169, 1933.
(8) MORNER, C. T.: Ztschr. f. physiol. Chem. 10: 511, 1886.
(9) RETTEW, G. R., GAHM, O. E., AND DIVINE, F. W.: Manual of Mushroom Culture. Chester County Mushroom Laboratories, West Chester, Pa. 3rd ed. 189 pp., 1941.
(10) MITCHELL, H. H., AND BEADLES, J. R.: J. Nutrition 2: 225, 1930.
(11) LUGG, J. W. H.: Biochem. J. 32: 775, 1938.
(12) KAPELLER-ADLER, R.: Biochem. Ztschr. 264: 131, 1933.
(13) SAKAGUCHI, S.: J. Biochem. (Japan) 5: 25, 1925.
(14) MCCARTHY, R. E., AND SULLIVAN, M. X.: J. Biol. Chem. 141: 871, 1941.
(15) KOLB, J. J., AND TONNIES, G.: J. Biol. Chem. 131: 401, 1939.
(16) KAPELLER-ADLER, R.: Biochem. Ztschr. 252: 185, 1932.
(17) HOLM, G. E., AND GREENBANK, G. R.: J. A. M. A. 45: 1788, 1923.
(18) SHINN, L. A., AND NICOLET, B. H.: J. Biol. Chem. 138: 91, 1941.
(19) BLOCK, R. J., AND BOLLING, D.: The Determination of the Amino Acids. 2nd ed. Minneapolis: Burgess Publishing Co., 1940.
(20) SANCHEZ, J.: Rev. Centro estud. farm. y bioguim. 16: 244, 1929. (Chem. Abst. 23: 2900.)
(21) SCHWEIGERT, B. S., MCINTIRE, J. M., ELVEHJEM, C. A., AND STRONG, F. M.: J. Biol. Chem. 155: 183, 1944.
(22) HUTCHINGS, B. L., AND PETERSON, W. H.: Proc. Soc. Exper. Biol. & Med. 52: 36, 1943.

AIRLINE FOOD SERVICE

A NEW FIELD is opening in food work, according to articles published in *Air Transport* and *Aero Digest* for May 1945. The airlines have an unusual feeding program that has received little attention. It is becoming more and more important as more people take advantage of this type of travel. To fly is a thrill but to have a delightful tray set before you at 10,000 feet, with fresh strawberries, piping hot pancakes, "little pig" sausages, and steaming coffee, is an added pleasure. Altitude tends to increase the appetite and for some time regular meals have been served, prepared in airport kitchens planned for a dual purpose: to serve meals at the field, and prepare meals to be packed and served aloft. This means that the kitchen must have room for a general preparation area, space for serving those eating in the restaurant and room for packaging food to go on the airplane. From the kitchen the food in most cases is taken in thermos containers. Beverages are transported in thermos jugs that fit compactly into the galley while the hot portion of the meals is placed in casseroles which fit into thermos containers built into this portion of the plane. All the requisites of the meal, including silver, hot beverages, hot food, and newly packed trays ready for service, are taken to the plane on small hand-trucks and packed in the assigned time-saving sequence just before time of departure. On a flight requiring more than one meal, canned and preserved goods, sandwiches, and extra soup are taken along so that a light meal can be served later. Almost every type of food is served in flight with the exception usually of cabbage, sauerkraut, and rutabagas. It has been found that these foods tend to cause discomfort at high altitudes. Few creamed dishes are served because they cannot be kept hot without deteriorating in quality and the difficulties in preparation are not generally worth-while. In serving the food it is merely taken from the thermos container and placed on the set tray. The beverage is poured into a specially heat-treated paper cup and placed in its notch on the tray. The notches for each item prove quite necessary when the plane drops a few feet in an air pocket. The trays themselves are quite delightful in appearance, with color brought out in the plastic dishes and the napkins, as well as in the food. There are individual salt and pepper shakers wrapped in sealed waxed paper envelopes. The eating utensils have been sterilized and sealed in another cellophane envelope.

A new system has been brought forward by Maxson's in Queens Village, New York. Every item of the meal is precooked within 5 minutes of completion. It is then quick frozen to below 0° F. on a paperboard plate treated to resist heat, and covered on the food side with a hard, harmless organic coating that is unaffected by heat or contact with foods. Fifteen minutes before service the plates are placed in an oven (350° F.) equipped with a fan to speed the thawing by circulating air. Of the 15 minutes, 10 are for thawing and 5 for actual cooking. Steaks can be precooked, well done, rare or medium. Vegetables on the same plate can be cooked the ideal length of time. This system is no longer an experiment; it has been used widely by the Navy in their overseas hops.—*Estelle Beall (University of Washington, 1945), now Administrative Student Dietitian, Women's Educational and Industrial Union, Boston.*

Promotions, Army Medical Department Dietitians

The following Medical Department Dietitians were promoted during the month of February 1946. They are on duty in Army hospitals in this country and overseas.

First Lieutenant to Captain

Barbour, Helen Frances, R-177

Second Lieutenant to First Lieutenant

Armstrong, Mary Agnes, R-2029
Bevins, Florence M., R-2017
Chapman, Bettie G., R-1373
Chase, Anna Marguerite, R-934
Dale, Lucile E., R-526
Ewing, Nancy Jane, R-1340
Goold, Rachel F., R-2109
Harper, Helen Louise, R-2151
Hotaling, Norma June, R-1342
Kibler, Alta Elizabeth, R-1265
Lager, V. Joanna, R-2154
Moore, Sue Winifred, R-1310
Pearson, Georgiana, R-2021
Taylor, Frances Perkins, R-1346
Teeter, Vivian Zoe, R-928
Walker, Florence S., R-2097

Army Medical Department Dietitians Separated From the Service[1]

The following dietitians have been separated under the provisions of the Separation Policy established by the Surgeon General for Medical Department Dietitians.

Captains

Faltesek, Alene C., R-193, 1260 Dayton, St. Paul, Minn.
Goff, Mary O., R-614, R. R. 2, La Junta, Colo.
Murray, Elizabeth M., R-395, 1844 Second Ave. S.E., Cedar Rapids, Iowa.
Rampley, Martha R., R-161, 626 E. Lake Drive, Decatur, Ga.
Stenz, Ruth M., R-281, 3545 W. Verona Court, Milwaukee, Wis.
Thompson, Delma F., R-342, 830 Walnut St., Charleston, W. Va.
Taft, Martha S., R-760, East Mill Road, Flourtown, Pa.

First Lieutenants

Altermatt, Lucille B., R-735, Box 65, Lakota, N. Dak.
Arzt, Elizabeth, R-751, 502-4th Ave. S.E., Jamestown, N. Dak.
Barnes, Martha L., R-1198, 1120 Beatty Ave., Cambridge, Ohio.
Barrack, Grace E., R-1086, 2414 S.W. 12th St., Miami, Fla.
Bave, Grace M., R-363, 464 Clinton Ave., Brooklyn, N. Y.
Burtch, Alva F., R-540, 620 Webster St., Bay City, Mich.
Chappatte, Betty T. W., R-870, 306 E. Broad St., Tamaqua, Pa.
Christensen, Louise K., R-511, Kensal, N. Dak.
Collins, Anne C., R-67, 2323 Blossom St., Columbia, S. C.
Contente, Dorothy, R-18, 2105 Burr Ave., New York.
Corothers, Lillie B., R-125, Clear Lake, S. Dak.
Cummings, Elizabeth M., R-1313, 197 Marion St., Springfield, Mass.
Dale, Mary, R-1192, 514 E. 1st St., Moscow, Idaho.
David, Mary E., R-1234, 6425 Harrison St., Hammond, Ind.
Denio, Ethel D., R-1021, 708 E. Main St., Stockton, Kans.
Doubt, Mary O., R-231, 4851 Lowell Ave., Lincoln, Nebr.
Ehler, Nellie M., R-460, 812 W. Healey St., Champaign, Ill.
Emerson, Pauline H., R-51, 3 Algonquin Ave., Toronto, Canada.
Farrell, Monica, R-1188, 1511 Tauromee St., Kansas City, Kans.
Fein, Beverly R., R-803, 75 Hill St., Waterbury, Conn.
Finnerty, Mary T., R-221, 523 Delaware Ave., Olyphant, Pa.
Foster, Roberta L., R-1077, 512 Robert E. Lee Apts. 2108 Hayes St., Nashville, Tenn.
Frey, Ruth L., R-506, 691 N. Graham St., Stephenville, Texas.
Gutsch, Minna L., R-1128, 256 W. Maple St., Viroqua, Wis.
Haight, Alice E., R-1295, Conde, S. Dak.
Halvorson, Sophie F., R-606, 1005 W. 6th St., Los Angeles.
Hereford, Jane G., R-1379, New Market, Ala.
Holthouse, Mary M., R-575, 721 S. 17th St., Corvallis, Oreg.
Hutchison, Jeanne M., R-2181, South Haven, Kans.
Jarussi, Rosemary, R-1180, Box 805, Red Lodge, Mont.
Keefe, Doris G., R-1101, 4773 Loretta Ave., Cincinnati.
Kelley, Frances P., R-840, 1215 Graham Ave., Eau Claire, Wis.
Kesner, Helen L., R-560, Pocahontas, Ill.
Kribbs, Elizabeth J., R-1407, Knox, Pa.
LaBerge, Annette M., R-810, 2516-4th Ave., South Minneapolis, Minn.
Lavelle, Marie V., R-1232, 3436 W. 128th St., Cleveland.
Lewis, Grace H., R-258, 2528-11th St. W., Seattle.
Linn, Josephine, R-584, 418 W. Innes St., Salisbury, N. C.
Malec, Slava, R-140, R. R. 1, Northville, N. Y.
McCracken, Gladys J., R-905, 7621 Euclid Ave., Cleveland.
McElreath, Mildred F., R-191, 712 W. Avenue, Cartersville, Ga.
McLaren, Mary J., R-1214, 627 W. Market St., Akron, Ohio.
Miller, Elma M., R-1288, 2416 Ong St., Amarillo, Texas.
Prusak, Helen D., R-428 416-2nd St. N.W., Chisholm, Minn.
Rajkowski, Rosemary K., R-898, Rice, Minn.
Ramsey, Ruth A., R-893, 1264 Jewell Ave., Topeka, Kans.
Reiss, Betty K., R-539, 34 Castle Shannon Blvd., Mt. Lebanon, Pa.
Richards, Georgia B., R-1351, Box 121, Grapeland, Texas.
Rodgers, Mary L. S., R-1424, 709 W. 11th, Geneseo, Kans.
Ross, Eloise, R-548, 662 S. Cass, Virginia, Ill.
Sadewitz, Jeanne, R-240, 19 Bond St., Passaic, N. J.
Samuelson, Ida K., R-434, 3236 Lakewood Ave., Seattle.
Schemmel, Ruth L., R-971, Worthington, Iowa.
Schroeder, Virginia M., R-842, 3824 N. Farwell St., Milwaukee.
Slentz, Margaret L., R-852, Lewis, Kans.
Smith, Carolyn E., R-1064, 3524 Utopia Parkway, Flushing, Long Island, N. Y.
Steinberg, Alice E., R-103, 311 Ward Street, Woonsocket, R. I.
Sussman, Sylvia, R-507, 1958-50th St., Brooklyn, N. Y.
Tavis, Clara B., R-1035, 725 University Ave., Boulder, Colo.
Taylor, Dorothy E., R-820, 3452 Knollcrest Ave., Los Angeles, Calif.
Tull, Margaret E., R-1197, James Walker Hosp., Wilmington, N. C.
Turner, Virginia V., R-543, Bedford, Va.
Vorhies, Dorothy L., R-1190, 2201 E. Jefferson St., Detroit, Mich.
Webster, Emma L., R-1003, 1017 E. Alder St., Walla Walla, Wash.
Weidlein, Wilma, R-877, 923 Walnut St., Webster City, Iowa
Wheat, Margaret H., R-1152, Windsor, Va.
Wilcox, Orilda L, R-528, Flanagan, Ill.
Yule, Eileen M., R-1275, % E. B. Yule, Mt. Forest, Ont., Canada.

Second Lieutenants

Barbee, Pauline B., R-2219, Box 444, Newton, N. C.
Black, Gladys M., R-2203, 2302-2nd Ave., N. Grand Forks, N. Dak.
Burnstad, Iva A., R-2229, 609 S. Main St., Minot, N. Dak.
Ellett, Louise, R-2095, Jennings Ordinary, Nottoway, Va.
Goldberg, Millicent, R-2147, 1792 Ocean Ave., Brooklyn, N. Y
Goodale, Harriet J., R-2190, 96 Maple Ave., Hamburg, N. Y.
Hanold, Frances, R-1402, 41 Kenmore Ter., East Orange, N. J.
Hardy, Caroline G., R-1411, 606 N. Dak. St., Canton, S. Dak.
Knott, Ada L., R-2241, 237 S. 2nd St., Montrose, Colo.
Lunnie, Ruth D., R-2260, Box 2, Lowrys, S. C.
Mauriello, Catherine V., R-2216, 36 Arlington, Worcester 4, Mass.
Phelps, Dorothy J., R-2312, 412 Mullett St., Dunkirk, N. Y.
Smith, Madge E., R-2453, R. R. 1, Bremen, Ind.
Townsend, Frances E., R-1260, 113 Union St., Calais, Maine.
Verseck, Dora V., R-2321, Alcena-Apt. 10, Creston, Iowa.
Wallace, Phyllis A., R-2155, Seymour, Ind.

[1] First Lts. Dorothy L. Swartz, R-461, and Marian A. Irvine, R-1065, were not separated as reported previously in this JOURNAL.

Editorial

MAJOR HELEN C. BURNS RECEIVES LEGION OF MERIT

On February 21, 1946, at the monthly meeting of all medical officers of the Medical Corps on duty in Washington, D. C., Major Burns, Director of Dietitians in the Office of the Surgeon General during World War II, was presented with the Legion of Merit by Major General Normal T. Kirk at the Army Medical Center. Accompanying the award was the following citation:

Major Helen C. Burns, R-1, Medical Department Dietitian, Army of the United States, as Director, Medical Department Dietitians, Office of the Surgeon General from January 1943–December 1945, was responsible for the organization and establishment of the Dietetic Branch and formulated procedures which resulted in outstanding professional achievements in the dietetic field. Her achievements significantly contributed to the effective care of patients in Army hospitals everywhere.

The Legion of Merit recognizes "extraordinary fidelity and essential service" in a position of responsibility and is conferred on "outstanding officers and enlisted men of the armed forces of the United States or of friendly nations." The medal is a red and white enamel star, placed on a laurel wreath and bearing a constellation of 13 stars on a blue field. The ribbon is a purple-red, edged with white. Secretary of War Stimson announced the establishment of the Legion of Merit on November 5, 1942.

LIEUTENANT FREELAND AWARDED BRONZE STAR

The Bronze Star was awarded to First Lt. Mary I. Freeland, M.D.D., December 7, 1945, at Headquarters, U. S. Army Forces, Western Pacific. The citation reads as follows:

First Lt. Mary I. Freeland, R-856, Army Dietitian, United States Army. For meritorious achievement at Cebu and Mindanao, Philippines, from 16 April 1945 to 4 July 1945, in connection with military operations against the enemy. As dietitian of a station hospital, Lieutenant Freeland was responsible for the supervision and preparation of diets while on temporary duty with an evacuation hospital in Cebu City during the time when the city was under fire from enemy artillery and shells were dropped in the hospital area. Working tirelessly, she supervised and prepared special diets for many seriously ill and wounded patients. Rejoining her parent unit, she served with various station hospitals and continued to perform her duties in a highly efficient manner during the height of the Mindanao campaign. By her steadfastness, technical skill, and devotion to duty, Lieutenant Freeland made a substantial contribution to the Medical Service during the Philippine liberation.

Lieutenant Freeland is a graduate of West Virginia University. She was assigned to the 172nd Station Hospital but, as the citation states, she was on detached service with other hospitals, while the hospital to which she had been assigned was being rebuilt. Previous to her assignment to Mindanao she was stationed in Brisbane, Australia, and in New Guinea. Following her terminal leave, she will be on the dietetic staff of the University of Pennsylvania Hospital, Philadelphia.

TRAINING AND QUALIFICATIONS OF DIETITIANS

The British Dietetic Association has distributed reprints from the *British Medical Journal* for November 3, 1945, on the "Training and Qualifications of Dietitians," based on a memorandum from the Nutrition Society. The report states that in July 1944 a Special Planning Committee was set up by the Nutrition Society (English Group) to consider and report on the training of persons in charge of the provision of food in institutions, industrial canteens, hospitals, etc. The summary of the committee's findings as published in the memoranudm was intended to serve as a basis for discussion, from which it was hoped that useful suggestions for the training of dietitians would emerge. A few excerpts from the report follow:

We consider that the description "dietitian" should henceforth be confined to such persons as are suitably qualified for registration as medical auxiliaries. . . . [based on] a Diploma in Dietetics from a university or training college approved by the British Dietetic Association, or alternately a degree in dietetics [similarly approved].

The term "dietetics" has been variously defined as "The part of medicine which relates to the regulation of diet" (*New English Dictionary*); as "Medical or Hygienic Art relating to diet or food in health and disease" (Webster); as "The study of food in its relation to human needs, health, etc." (*Universal Dictionary*); and as "The interpretation and application of the scientific principles of nutrition in health and disease" (British Dietetic Association). Of these the last appears to us to be the more precise, and we suggest its expansion to read that dietetics is "The interpretation and application of the scientific principles of nutrition to the human subject in health and disease."

The terms "dietetics" and "dietetic treatment" seem to have been well established with their modern connotation

by the middle of the nineteenth century; but the word "dietitian," though it occurs about the same period, is commonly of more recent usage. There is some doubt as to the correct spelling of the word. We recommend that the customary spelling be retained; and we define a dietitian as one who is qualified as above.

While we consider that the diploma course in dietetics has met the needs of dietitians in the past, the profession has widened its field of activity, and we believe that a uniformly high standard of training should now be established. The most desirable way of reaching this standard would be the opening of a university degree course in dietetics. The course should combine the requisite basic scientific training with all the essential practical work.

Many newly qualified dietitians will lack the experience that enables them to deal with the complex problems of catering and administration, and they will have no more than a theoretical understanding of educational or hospital etiquette. It is necessary, therefore, that they should, after qualifying, have ample opportunity for service under an experienced professional person. This can be effected only gradually as the posts of catering officers and meal organizers or dietetic advisers come to be filled by qualified persons capable of initiating their assistants in the complexities of their professional duties.

It is important that status and function of the dietitian should be clearly defined; the present position is vague and anomalous. At present there is a fairly widespread tendency to regard purely institutional work—*e.g.*, in hospitals, orphanages, schools, etc.—as the only proper sphere for a dietitian. There is nothing in the definition of dietetics to justify this limitation of function. Food is by far the most important environmental factor which determines health, and the dietitian should in our view assume her due place as a public health official. In this capacity she can exert the maximum influence in the community.

The medical officer of health as the person responsible for the health of the inhabitants within his area should have on his staff an experienced adviser in dietetics, just as he has special officers to advise him on sanitation, food inspection, and various branches of medicine. A post of this nature would be one for a senior dietitian, and would probably rank as among the highest in the profession. The functions of such an officer would be broadly to advise the M.O.H. on all dietetic matters falling within his sphere: diets in hospitals, orphanages, and other institutions controlled by the local authority, school meals, advice on diet to mothers in clinics, and educational work. Such educational work might well include cooperation with those responsible for the teaching of nutrition in schools, welfare centres, and advice bureaux. In addition, the dietitian would be expected to play an appropriate part in the conduct of dietary surveys and other nutritional investigations.

Every hospital of about 150 beds or more should have its qualified dietitian responsible only to the medical superintendent or his equivalent in a voluntary hospital. Large hospitals of about 500 beds or more would require a number of junior dietitians as well as a senior one.

It is almost certain that senior advisory posts will become available in the health and education departments of the Government, and some of the larger food and drug manufacturing firms will probably require dietitians for advice and research.

It is desirable, finally, to assure the status of dietitians in local government or hospital employment. The dietitian should be given full responsibility for the work of her department. When employed by a local authority she should be responsible through the appropriate senior officer to the health and education committees. In hospital practice she should be responsible to the secretary or medical superintendent, and should be a member of a catering committee representing those concerned with hospital feeding. In many hospitals the position of the dietitian is not clearly defined in relation to the matron's sphere of control, while she may have little or no contact with the medical staff. If she and her assistant dietitians are to have the opportunity of advising and directing in ward feeding, outpatient departments, schools, day nurseries, etc., they must have unquestioned right of access to the *chief administrative officer concerned.* [Italics ours.]

The Nutrition Society and the British Dietetic Association are to be congratulated on this carefully worded report. Especially commendable, it seems to this writer, is the report's stress on the need not only for the basic scientific training but for "essential practical work." We read: "The profession should not in our view be open to those who have attained a degree only in the theoretical and experimental aspects of the science." Further, it is said: "The profession of dietitian will be much enriched by the recruitment of persons who have successfully controlled large-scale kitchen establishments through the searching years of war." Obviously, the Nutrition Society looks upon the ideal dietitian as a practitioner, not as an academic theorist, which is in keeping with Webster's definition[1] of the dietitian's profession.

With like sagacity and foresight, in explaining the use of the pronoun "her" in the report, a footnote states: "It is clear to the Committee that the dietitian of the future may be a man or woman, but for the purpose of this memorandum the feminine [pronoun] has been used." This, too, is as it should be, since sex no longer is considered a barrier to any of the professions, or indeed to few if any of the arts and manual skills.

BETTER METHODS OF REFRIGERATION

A forward step toward promoting better methods of refrigeration has been taken by the American Society of Refrigerating Engineers in the publication of their new quarterly *Refrigeration Abstracts*,[2] the first issue of which appeared in January of this year.

In this issue about 300 United States and British publications have been checked, in addition to patents, for suitable articles to abstract. The material is classified under eleven main divisions, and an annual author and subject index will be included. A staff of 58 engineers and scientists prepared the copy for the first issue, all of whom were selected on the basis of their specialized knowledge of the subjects assigned. Thus excellent coverage of this increasingly important branch of the food administration field is assured, and busy dietitians can by such means keep fully informed on developments in modern refrigeration methods.

Among the 38 articles abstracted under Section VIII, Foods, five are based on articles which have

[1] Webster's second edition, unabridged, defines *dietetics* as "The science and art dealing with the application of principles of nutrition to the feeding of individuals or groups under different economic or health conditions."

[2] Domestic subscription $7 per year; address *Refrigeration Abstracts*, 40 West 40 St., New York 18. The Editorial Office is at the University of Tennessee; the Publishing Office, Easton, Pa.

appeared recently in this JOURNAL. Under Section IX, Refrigerating Applications, appear abstracts on such pertinent topics for dietitians as air-conditioning, locker plants, methods of freezing meats, etc., storage, airborne transportation of foods, and an abstract of an article by Mabel Ashenfelter, a member of the American Dietetic Association, on improved refrigeration for cafeterias which originally appeared in *Refrigerating Engineering*.

But this is not all that is commendable in this new publication. The Foreword, the key to the use of abstracts, the list of abbreviations and symbols, the carefully and accurately prepared list of periodicals with addresses and standard abbreviations of the titles, can be read by editors, writers, teachers and others with profit. In fact, the whole publication reflects the high standards of organization and attention to detail which one might expect of a publication under the auspices of a society of engineers.

IODIZED SALT IN THE PROPHYLAXIS OF ENDEMIC GOITER

There are ample data proving that endemic goiter can be prevented and simple, practical methods of prevention are known. The present need is to place this important public health problem under the proper authority so that it will be continued generation after generation, according to a report of the Council on Foods and Nutrition which appeared in the *Journal* of the American Medical Association, January 12, 1946.

The prevention of endemic goiter in man was begun on a large scale in 1916. Analyses of food and water indicate that the amount of iodine in the water supply is an accurate index to the food iodine found in a given section.

Ten years have now elapsed since the last organized study and campaign for goiter prevention. No such study or campaign is being considered at present. The only information available is in the clinical studies and personal findings of physicians interested in the prevention of goiter. During the past two years, in examining school children in Detroit and Cleveland, numerous small or moderate-sized goiters have been observed. In each case the children had not been using iodized salt nor had they used it for one or more years. Several families had decided that, since nothing had been heard about goiter prevention for several years, the "epidemic" was over and therefore they were purposely using plain salt.

Complete information on the amount of iodized and plain salt used each year is not available. The only information obtainable is the statement by the salt producers that the percentage of iodized salt consumed has gradually decreased during the past four or five years.

In spite of the many surveys in this country and abroad there appears to be no cumulative knowledge among the general population about the cause and prevention of endemic goiter. Furthermore, there is an abundance of data on the efficiency and safety of iodized salt as a means of prophylaxis; yet the consumption by the general public gradually decreases unless repeated campaigns are made by state health departments to encourage its use. It is recommended that the American Medical Association, the American Public Health Association and the Federal Food and Drug Administration cooperate to give the entire country a natural salt containing 0.01 per cent potassium iodide or its equivalent. The term "iodized" should be eliminated at once and emphasis placed on the use of a whole salt or natural salt to prevent food deficiencies. The need is for only one kind of salt, standardized so that it contains the important food elements found in the natural unrefined salt. The "prevention of endemic goiter" will then be as nearly completed as any public health measure can ever be, according to this report.

Current Comment

NOW THEY EAT BETTER IN TAOS

T. SWANN HARDING

Tourists have long found Taos County and Taos village, New Mexico, to be charming, picturesque, and generally delightful. The Spanish-Americans, who comprise 96 per cent of the county's inhabitants, were regarded as an indispensable part of the scenery, which includes elevations rising from 5700 to 13,200 feet, and arresting mountain ranges and canyons.

What the tourists overlooked, however, was the fact that the gentle-mannered Spanish-Americans were neither robust nor especially energetic because they had been undernourished for something like three centuries. They were dwarfed, suffered a constant deficiency of oxygen at these high altitudes, and their customary diet was deficient alike in good protein and in certain vitamins and minerals.

A few years ago various permanent and summer residents of Taos County and of the state of New Mexico generally, became interested in the fact that the county's inhabitants had the highest infant death rate in the country. The cash income of these subsubsistence farmers still averages less than $300 a year, and two thirds of them have to manage with $250 or less. One third of their children die before the age of eighteen. Tuberculosis, diarrhea, and enteritis abound.

Finally something was done to aid these impoverished people. The Farm Security Administration began to render assistance to the rural inhabitants—and the entire county is really rural—both as to their farm operations and their medical care. The county's doctors and dentists were then all located in the village of Taos, and most of the rural people lived at some distance and on dubious mountain roads; because of this, in two thirds of the cases people died without medical attention.

The University of New Mexico and other state agencies made a survey of the county. In June 1942, after the FSA decided to make a grant for the county, the Taos County Cooperative Medical Association was established, to fill the greatest need found. The Association now provides complete medical and partial dental care for some 6000 of the county's 14,000 inhabitants (wartime figure; 18,000 before the war) at an annual cost of $60,000 to $70,000.

So far most of the cost is borne by the FSA. But as the health and incomes of the inhabitants improve they will be able to assume a greater part of the burden. The health service is countywide, available to practically all the inhabitants, and is provided from several conveniently located clinics and medical centers. Doctors, dentists, nurses, and nonprofessional aides work on a salary basis. The people are rapidly being weaned away from superstition and dread of hospitalization. Membership is on the increase.

Since poor diet has played an important role in keeping the people undersized and unhealthy, the nurses and doctors do all they can to improve the eating habits of the members. In Taos the average farm is no more than five acres, livestock is of the poorest, and the small acreage limits the quantity of hay and seed produced for livestock feed.

In the past, hunting furnished much of the meat; now hunting and fishing are limited by law. The people have thus tended to accustom themselves to a diet consisting chiefly of beans, chili, potatoes, *tortillas*, flour, and lard. This diet has been irregularly supplemented with produce from summer gardens, or, in winter, by slaughter of hogs or beef cattle, with short periods of glut thereafter.

Dried squash, chili, fruits, and meat varied the diet slightly, although meat has been used more in sauces than as a main dish. The meat was dried in strips on the family clothes-line; squash, cut into swirls, was often strung on the same line. Fruits were cut and dried in trays in the sun, while strings of chili commonly dangled everywhere from roofs, porches, and the sides of houses.

Thirty or forty years ago wet nurses were called upon to care for infants that the mothers could not attend. But if the nurse wanted to skip a nursing period to go dancing, she made a gruel, *polvillo*, from toasted, sifted wheat or corn meal, which would carry the infant along for a while. At ten or eleven months the child was fed broth, thin soup, and bean juice. Somewhat later bread was added, then solid foods generally.

In giving advice about diet for infants the doctors and nurses of the medical cooperative now seek to take into consideration foods common to the Spanish-American diet and others easily available, since it is useless to advise consumption of foods which the people will not eat or cannot procure. Modern methods of infant feeding are now being introduced by physicians of the New Mexico State Health Association and the U. S. Public Health Service.

Progress in health education is necessarily slow because the time of the medical and nursing staff is so largely occupied with the more immediate needs for medical therapy; thus attention to preventive medicine and nutrition education tends to be secondary. It has been impossible to make detailed studies or surveys, and the staff works on the basis of information acquired in the daily rounds.

Milk is a less difficult problem than in early days, for even the poorest families now manage to get canned evaporated milk. Breast feeding is emphasized, however, and its advantages are stressed. Mothers are directed always to prepare each feeding just before the feeding time, if the infant is bottle-fed, and always to boil the water since water supplies are often likely to be contaminated.

Eggs are introduced into the infant's diet quite early, but they are very scarce in winter, hence strained bean juice is recommended as a substitute. *Requeson*, a cheese similar to cottage cheese, becomes part of their diet at about one year of age. Often, if the father of the family believes more money can be made in industry over in Colorado or elsewhere, the entire family will depart, leaving gardens and chickens to shift for themselves.

Fortunately, the popular pinto bean is a very rich source of assimilable iron, and of calcium and phosphorus. It is likewise flavorful and high in vitamin B_1. The beans are cooked till tender, mashed through a sieve to rid them of skins, and the purée is fed to infants. The New Mexico Agricultural Experiment Station has made a special study of cooking pinto beans for the use of adults. The old Mexican method was to soak the beans in boiling water in an earthen pot, then to cook them till tender enough to eat, adding chili powder, salt, and onions toward the end of the cooking period. This procedure took from 4 to 24 hours. The present method calls for soaking the beans for 10 to 14 hours in water to which soda has been added, then draining and cooking for 2 hours in fresh water.

Since citrus fruit is scarce and expensive, it was necessary to seek some other source of vitamin C. Raw rutabagas are quite satisfactory, and these are found in many gardens. The raw vegetables are washed, peeled, ground or mashed, and the extracted juice is then fed to the infant. More recently, *champe*, the ripened wild rose hip, has come into use as another source of vitamin C. It is made into syrup, jelly, or jam, or used in combination with other fruits.

Although the people of Taos use lamb's-quarters and some dandelion greens as leafy vegetables, a blank wall has been met so far in attempting to induce them to consume beet and turnip greens to supplement their pork and chili. Though both vegetables are grown widely, the people do not regard the tops as food; and nurses still patiently suggest that the tender leaves, after straining, as well as the water in which they are cooked, are excellent for children.

"Let them EAT milk!"

When patients cannot tolerate, or refuse to *drink* cow's milk, they will often delight in *eating* flavored rennet-custards prepared with either "Junket" Brand Rennet Powder or Rennet Tablets, containing rennin. • Besides changing the physical consistency of milk—often psychologically so important—rennet-custards yield softer, finer curds which are more easily digested than the hard, large curds of untreated cow's milk. • For further information and samples of free infants' and children's diets, please fill out coupon. We'll also include samples of "Junket" Rennet Powder and Tablets.

"THE 'JUNKET' FOLKS", LITTLE FALLS, NEW YORK

"JUNKET" is the trade-mark of Chr. Hansen's Laboratory, Inc., for its rennet and other food products, and is registered in the U. S. and Canada.

46-G

"THE 'JUNKET' FOLKS"
Chr. Hansen's Laboratory, Inc.
Little Falls, N. Y.

Please send me samples of your infants' and children's diet lists. Also samples.

Name_____

Address_____

City_____ State_____

The medical and nursing staff always stress the importance of family gardens, not only for summer foods but for those that can be conserved for winter as well. The FSA likewise plays an important role in improving the general dietary habits of these low-income families in Taos. Each family is encouraged to grow a vegetable garden and to produce milk, eggs, and meat for home use. Increased production of these foods has resulted under FSA supervision.

To ensure a year-round supply of food for a well-balanced diet, the Taos families have been taught to preserve their winter supplies of vegetables, fruits, and meats by canning them, using pressure cookers. A modern method of home food dehydration has also been introduced by the FSA home supervisor and is rapidly replacing traditional methods of food drying. All families in the FSA program must complete adequate canning quotas each year.

Thus the medical cooperative and the FSA together are doing a great deal to transform the people of Taos County, from undersized, malnourished, and unhealthy human beings, into sturdy American citizens. One of the nurses is a full-blooded Indian woman—tiny, light as a feather and, indeed, named Mrs. Feather. Another is a native Puerto Rican. Both naturally work well with their fellow Spanish-Americans, but the other nurses learn the Spanish language in a specially streamlined course and all regard their charges with eager friendliness. Upon visiting the homes one finds the mothers listening intently to what the nurses have to say, and doing their best to follow dietary instructions written out for them in Spanish.

The homes are humble and ill-equipped, but are cleaner now. More fly screens have appeared and better sources of water supply are being introduced. Under the general guidance of FSA and certain state officials, the inhabitants of Taos county are progressing. Soon they will not be mere picturesque adjuncts to the mountain scenery, but able-bodied citizens maintaining themselves at decent standards of living.

A NUTRITION NEWS COLUMN

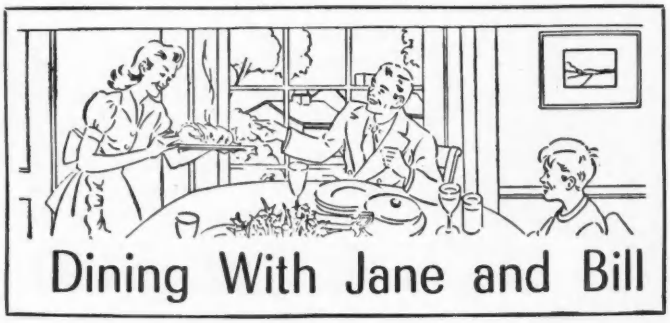
ELIZABETH K. CASO AND MARGARET P. CALDWELL

Department of Nutrition, Harvard School of Public Health, Boston, and Newton Nutrition Center, Newton, Massachusetts

A weekly news column entitled "Dining With Jane and Bill" is an unusual and most successful part of the general community nutrition service sponsored by the Newton Nutrition Center. The column has appeared weekly in the local paper since its inception over a year ago and has gained wide recognition, even to the extent that other communities have asked permission to use the column.

The Newton Nutrition Center is a community service sponsored and financed by the Health Department, Community Chest, and the local chapter of the American Red Cross. It is closely affiliated with the Department of Nutrition of the Harvard School of Public Health, for two members of the Nutrition Department serve on the Newton Nutrition Committee which controls the activities of the Nutrition Center. Graduate students at the school observe and participate in the various activities of the Nutrition Center under the supervision of a department member. The Nutrition Center employs two full-time nutritionists who conduct an extensive program in cooperation with the health and welfare agencies in the city, as well as with the school department, for the purpose of developing an integrated course in nutrition in the classroom. Visual nutrition education material, in the form of posters and exhibits, is prepared and widely used in strategic places in the city, such as well baby and preschool conferences, libraries, industrial plants, railway stations, store windows, etc.

The newspaper column, "Dining with Jane and Bill," is one of the features of the community nutrition service. It is written in conversational style and is planned to feature timely and practical information about nutrition. The following are typical columns that have been used:



Bill: Honestly, Jane, this meat situation is something! A couple of the boys from the office walked down through the market with me this noon. Half of the stalls were empty. *Empty!* Had signs out "No Meat," or "Out of Meat."

Jane: Yes, I know. The meat situation is unbelievable. But it *is* true that with a little planning one can get along all right.

Bill: All right for us, perhaps, because you know what to do.

Junior: Guess you slipped up tonight, Mother. Baked beans and brown bread aren't fish or meat!

Tip-off!

Which establishment is going to get the better employe?

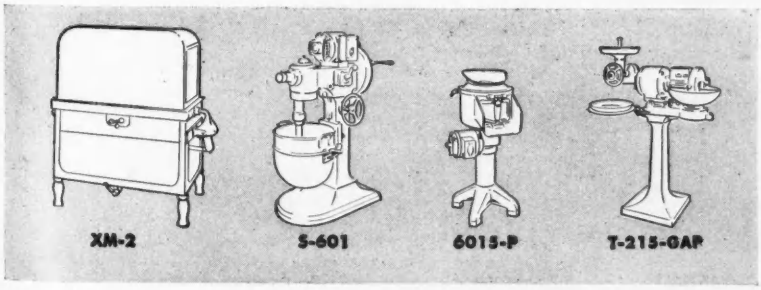
—and through his more intelligent efforts, provide the better service that builds volume?

—and because he can produce more with the food machines provided, earn better for both himself and you?

—and so contribute to the healthy growth of a successful operation?

One guess! Up-to-date kitchen machines *plus* production methods, *plus* higher employe standards are the keys to success today. And every one of them hinges on the other.

Food handling methods have changed tremendously in the last half century—and pioneering every change for the better has been the development of another food machine by Hobart—another dishwasher, peeler, slicer, mixer, chopper or coffee mill. And there'll be others—soon!



Your local Hobart dealer knows these machines, of course. You'll find his knowledge of kitchen problems just as valuable. He's as fully qualified to discuss layout and traffic flow as equipment, and, putting both together, to help you raise standards and lower costs.

Your kitchen is your business. See your Hobart dealer today.

ARMY ★★ E ★★ NAVY

Hobart *Food Machines*

THE HOBART MANUFACTURING CO., TROY, OHIO • *Factories in Troy, Dayton, Greenville, U.S.A.*

CANADA • BRAZIL • ENGLAND • AUSTRALIA • FRANCE

Jane: Right you are, but beans are just about as rich in food value as meat.

Bill: Well, I've "licked my platter clean." Guess we are all ready for that dessert.

Jane: Here you are—a fruit salad with crisp toasted crackers.

Junior: Is *that* meat?

Jane: No, but there is a whole cup of cottage cheese in this salad.

Bill: Your fruit salad is better than ice cream as far as I'm concerned.

Jane: I know we all like it. I've been buying at least a pound of cottage cheese each week lately. It is just about as good for us as a pound of meat, and certainly a lot cheaper.

Note: Perhaps you would like to know just what Jane had for a balanced dinner:

Boston baked beans — Hot brown bread
Relish plate of sliced tomatoes, cucumbers and onion
Cottage cheese fruit salad — Crisp crackers
Milk

Junior: Gee, Mom, this is an interesting book. I'm reading about the Pony Express. Do you know how long it took a letter to go from Denver to San Francisco?

Jane: No. But I'll bet it was quite a while. We're certainly lucky to have such fine transportation nowadays. Just think of the things we use that come clear across the country. Why, even lots of our food travels thousands of miles before we get it, such as the oranges from California.

Junior: Say, I could sure go for a big, juicy orange right now. Are you getting stingy or something? We haven't had many lately.

Jane: You know I'm not stingy with anything as necessary for health as good food. But oranges have been scarce and not too good.

Junior: But I thought they contained vitamin C or something-or-other, and we had to have them every other day.

Bill: Hi there! What's this we have to have every day?

Jane: Hello, dear. Junior thinks I've been skimping on the oranges.

Bill: Well, come to think of it, maybe you have. Better get some more.

Jane: But Bill, we really don't need them every day if we include other things in our diet such as cabbage. This cabbage I'm fixing now is an awfully good source of vitamin C.

Junior: Is that cabbage? It doesn't look like it.

Jane: That's because you didn't see it when I started. This is cabbage au gratin. It has a cheese sauce over it. I'll just stick it in the oven, and you just see if you don't think it's delicious when we eat dinner.

Bill: It looks good. But it sounds strange to hear you say cabbage can be substituted for oranges.

Jane: But it's the truth. A half cup of shredded raw cabbage contains more vitamin C than a medium-sized orange.

Junior: Boy! I must really have got a lot of vitamin C in that cole slaw I ate last night. Dad and I sure go for that.

Jane: And we'll be using a lot of cabbage these coming days because it's so good and fresh, and besides that it's helping keep our food costs down. It's very inexpensive just now.

Bill: Good enough! Let's have more cabbage.

For cabbage recipes, call Newton Nutrition Center.
See the cabbage exhibit in Newtonville Library.

Jane: Say, Bill, that wooden box you made for the milk is really working O.K. It keeps the sun off the milk as it sits on the doorstep and I don't have to worry about it freezing these days. Besides, several times I used to find the neighbor's cat purring around our bottles.

Bill: I'm glad you like it, dear. It was really easy to make. What was the name of that vitamin we read about—the one so easily destroyed by sunlight? Isn't that what started us thinking about making that box?

Jane: Oh, yes, it's riboflavin. We had a lecture on it once in our nutrition course.

Bill: Seems I've heard a lot about different vitamins but I've never heard of this one. What is it?

Jane: It's often called vitamin B_2—riboflavin is the chemical name. By the way, our diets can easily be quite low in this vitamin.

Bill: What happens when we don't get enough of it, anyway?

Jane: Oh, several things that are hard to define. You may feel weak and run down. More severe signs show up in the skin, eyes, mouth, and tongue. For example, the skin at the corners of the mouth becomes cracked and inflamed.

Bill: Did you find out what foods we need to eat to get enough riboflavin?

Jane: As I remember, there aren't many foods that are especially high in this vitamin. Milk is the best source. Other good sources are meat, liver, fish, eggs, cheese, "greens," and fresh and dried peas and beans. Speaking of greens, things like escarole, kale, spinach, collards and mustard greens are really pretty good.

Bill: So that's why you got me to try some of those new things in the garden last spring! Smart girl!

In Jane's nutrition notebook we found these interesting figures: Adult recommended daily allowance of riboflavin, 2 mg. Foods that would furnish this amount of riboflavin for the day:

Milk, 1 pint	0.9
Egg, 1	0.2
Meat, average serving	0.3
Green leafy vegetable	0.3
Bread, cereals, 6 servings	0.3
Miscellaneous, fruit, potato, etc.	0.2
	2.2

Bill: Pass me the sugar will you, Junior?

Junior: Here, Dad—oh wait a minute, I want some for my cereal.

Jane: Say, the way you two use sugar! No wonder I have so little for baking.

Junior: Oh gee, Mum—can't a fella have some on his cereal?

Jane: Sure thing. But look, I cooked some raisins in the cereal this morning to make it sweet. If you had tasted it, you would have found you could have used a lot less sugar. I'm going to do this right along now; I think I'll also try prunes and dates in the cereal.

Junior: Hmmm—it is good. O.K. I'll save on the sugar tomorrow morning.

Bill: Are we getting low on the sugar supply, Jane?

Jane: Yes, and the new sugar coupon stamp is going to have to last us four months instead of three. That means a little more than 1 pound or about 3 cups per person per month.

Bill: Well, I'm not very heavy on sugar.

Jane: Oh Bill, how can you talk that way?

Junior: You're in for it, too, Dad.

Jane: Yes, Bill, you always put two heaping teaspoons in your coffee. Then the worst part of it is that some of it doesn't dissolve and I find it in the bottom of the cup when I wash the dishes.

Bill: Well, I suppose I am careless. If you think you can make us a cake once in a while if we check this waste, I'll do my part.

Junior: Me too, Mum.

DOWN COMES THE PRICE OF DOUBLE TOUGH TUMBLERS!

THEY'RE the same lightweight, sparkling tumblers you bought before . . . but now wide acceptance and volume production permits us to bring you Double-Tough Tumblers for little more than you'd pay for everyday, fragile glasses! Get the lowdown from your Double-Tough Tumbler Distributor today. Figure for yourself how much you can save . . . initially, with the new low prices . . . in service, with tumblers that are specially processed to take at least twice the punishment under rough handling. Then place your order fast for prompt delivery!

NOW THE LITTLE GLASSBLOWER STANDS FOR LOWER FIRST COST, TOO!

See your Double-Tough Tumbler Distributor today!

Consumer Products Division, Corning Glass Works, Corning, N. Y.

CORNING *means* Research in Glass

Corning double-Tough Tumblers

Among the other subjects that have been discussed in the "Jane and Bill" column are canning, gardening, use and care of fish liver oils, vegetable cookery, food habits, nutrient requirements, sources of the various food constituents, and various problems relating to rationing and food shortages. This popular style of presenting sound facts about applied nutrition has been very well received and the "Jane and Bill" column has developed into one of the most useful and practical publicity and educational features of the entire Community Nutrition Program.

NUTRITION CLASSES FOR CHILDREN

EVA N. YLVISAKER

Head Dietitian, Children's Hospital, Cincinnati

The health of a child is dependent upon two principal factors, physical and mental development. These two factors are so closely interrelated that a knowledge of both is necessary A cooperative program developed in a children's hospital by the medical, nursing, child care and training, and nutrition departments provides a unique and stimulating opportunity to contribute to the future health of a group of children.

This is a report on the nutrition classes and exhibits which have been developed by student dietitians as a part of their required training while on the pediatric service at the Children's Hospital, Cincinnati.

Student dietitians are on the service essentially to study the nutritional needs of the child and to make first-hand observations on the modifications of the normal diet which are necessary on a pediatric service. They also study the food habits of children and determine the success of their own menu planning. Every opportunity is offered the student to work with the children. By centering their interest on the child rather than on the routines and mechanics of serving, an unlimited field for study is afforded since each child presents different problems. It has seemed to me that one answer to such a responsibility lies in the method of teaching. Certainly a richer field for disseminating a few food facts cannot be found.

The children are brought to an attractive room, known as the playroom, for their instruction in nutrition. The class periods are short, lasting only 15 to 20 minutes. The children are between the ages of 8 and 12 years. Often there are younger children in the group, but they are given other forms of activity which do not disturb the group taking part in the nutrition class

The preparation of these lessons, as a rule, is not easy for the student. I feel that she may be more familiar with a topic of her own choosing and the classes, therefore, are not taught in a specified sequence. This freedom in the choice of a topic entails no problems since almost every class is made up of a new group of children. Even those who listen to the same subject twice profit by a second presentation.

Classes on the following topics were presented by this year's group of student dietitians: milk, calcium, iron, protein, carbohydrates, fats, vegetables, vitamins A, B, C, and D, cereals, and teeth. In preparation for her class, the student writes a complete lesson plan in which the purpose is clearly stated, and the complete content of the lesson correlated with the experiences of the children. For instance, in the lesson on food iron the primary purpose was to show that iron helps to make good blood; second, to familiarize children with foods rich in iron; and third, to acquaint them with the functions of the blood. This lesson was developed as follows:

The student began by stating, "You obtain water by merely turning a faucet, and it comes out in a clean, cool stream." She then asked the children, "How does the water get to the water faucets in your home?" This question was followed by, "Where does the water come from?" The children contributed some answers, thereby introducing their experiences. The student proceeded with a simple explanation of a city water system, showing pictures of a reservoir, a pumping station which pumps water into large pipes from which in turn it flows through smaller pipes into our homes. This was followed by a picture of the circulatory system. Each topic was developed in line with the experiences of the children.

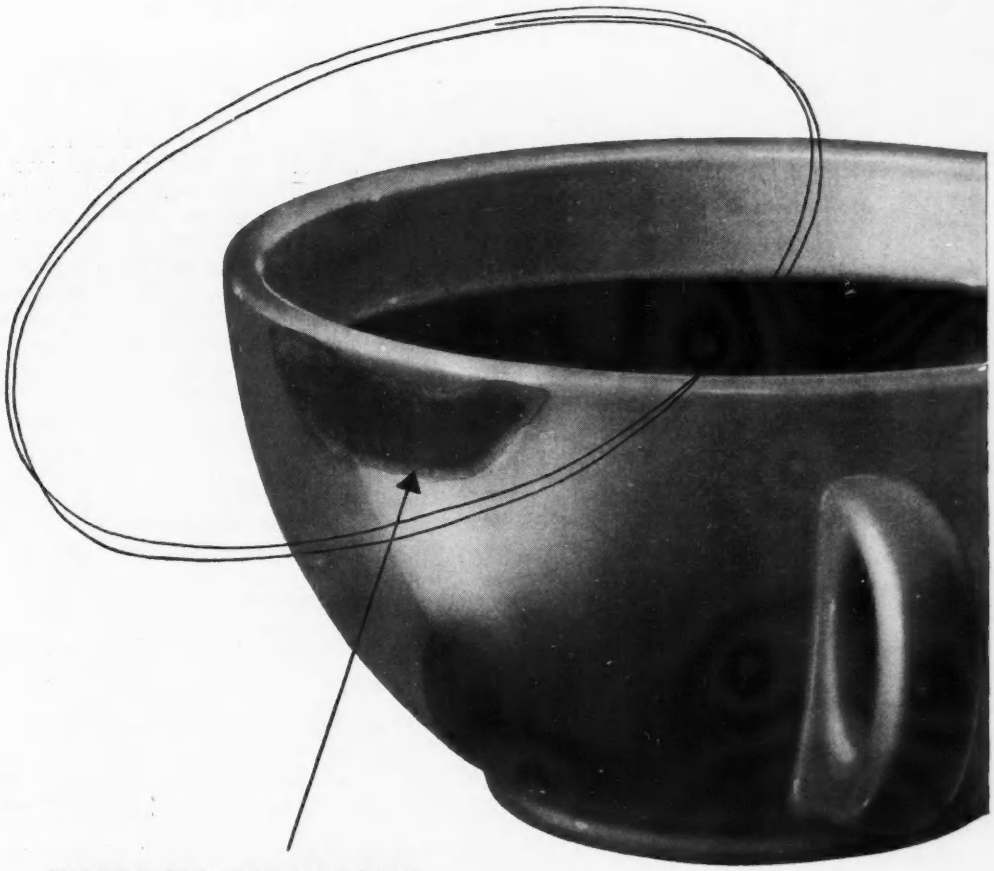
A lesson plan on carbohydrates and fats is presented in Table 1.

TABLE 1

Purpose:

1. To show the children that the body must have food to give it energy.
2. To show the children the foods which will best serve this need.

Contents	*Experiences*
I. A Train	
A. The engine pulls the cars loaded with passengers and freight.	*Question:* "How many have ever noticed what pulls a train of of cars?" Write the word *engine* on the board.
B. An engine needs power for its work.	*Question:* What does the engine have to have to pull the cars? Write *power* on the board.
II. Engine Foods	
A. Coal gives power.	*Question:* What gives it power?
1. Coal is food for the engine.	
2. Power to go and to work comes from the food that the engine burns.	
3. The fireman adds more coal when other coal burns out.	*Question:* What does the fireman do when the coal burns out?
B. Oil gives power.	
1. A ship needs oil for work.	



INEFFICIENT DISHWASHING

WAVES A RED FLAG

Lipstick on a newly washed cup or glass is obvious evidence that your tableware is covered with dangerous washing film—the film that offers a harbor for germs, odors and rancid tastes. The reason is, you can't remove washing film without removing lipstick.

To do a really sanitary, as well as a physically clean job, any washing compound must contain sufficient Calgon—for Calgon eliminates washing film—makes water 100% soft— stimulates alkaline cleansing to vigorous activity—prevents formation of scum or scale.

Calgonite contains a full 40% of Calgon. Test it against any competitive product and you'll see that it gives you tableware that not only looks much cleaner but is much cleaner. Also, compare it on a cost basis, with other washing compounds—that is the cost of getting clean tableware, not the misleading comparison of price per pound of compound...Then you'll know that a Calgon* product is modern science's most economical answer to efficient dishwashing...Write for free booklet containing complete instructions for better dishwashing. Calgon, Inc., a subsidiary of Hagan Corp., Hagan Bldg., Pittsburgh 30, Pa.

WASH MORE DISHES—CLEANER

use Calgonite

IT CONTAINS 40% CALGON

CALGONITE* for mechanical dishwashing. CALADE* for hand dishwashing. CALGOLAC* the sudsless cleanser for bar glassware. NOCA* all-purpose kitchen cleanser for hand use. **Reg. U.S. Pat. Off.*

TABLE 1—*Continued*

Contents	*Experiences*
C. Gasoline gives power to the: 1. Automobile 2. Tractor a. To haul logs. b. To do farm work. 3. Airplane	*Question:* What does your father feed his automobile?
D. Give food to any engine. 1. The food burns. 2. The burned food gives us energy and heat.	Show pictures of active children.
III. The Body Engine A. To feed with food. B. The food burns in our body engine. C. Burned food gives us: 1. Heat. 2. Power for work and play. D. Must keep body supplied with food. 1. Eat three square meals a day. 2. Start the day with a good breakfast. 3. If we are ill or underweight we can also eat nourishing food between meals. E. Pep and energy mean power.	Write on board: *Body Engine.* What do you feed it? *Food.* What does the food produce? *Heat* and *Energy.*
IV. Foods for the Body Engine A. Sources of starch. 1. Sweet foods contain sugar. 2. The best kind of sugar for our engine is in fruit. 3. Too much candy keeps us from eating the food the body needs. 4. Foods that contain starch or sugar are called carbohydrate foods.	*Question:* What foods give us heat and power? Show pictures of heat and energy foods. *Question:* Starch and sugar foods make up the carbohydrate family; can you name some carbohydrate foods?

Write on the board:

Starch	*Sugar*	*Fat*	*Oil*
Potatoes	Sugar	Cream	Nuts
Bread	Fruit	Butter	Peanut Butter
Cereal	Honey		Salad Dressing
Macaroni	Syrup		
Corn	Candy		
Beans			

B. Sources of fat and oil.	*Question:* Where will you find fats? List foods under fat and oil headings.
V. Summary A. Starches, sugars, fats, and oils give us heat and energy for work and play. B. These are fuel foods because they burn. C. These are energy foods because they give us energy to do things.	

There were two lessons on calcium, each student stressing the importance of calcium from a different angle. One student, upon starting her lesson on calcium, asked a child to take hold of his hand, wrist, and elbow, and feel the hard substance under the flesh. Then she asked him what it was. The other student started her class on the same subject by asking the children if they had ever seen a skyscraper or tall building in the process of being constructed. She talked about the strong arches and rods which were needed in its construction, and soon she had the children feeling for their long and short bones.

A lesson on green, leafy vegetables was particularly successful. The student correlated it with a garden which the children had planted in boxes. In the garden were radishes, nasturtiums, and sweet peas. First she discussed the garden with them, and how, in some countries, even the nasturtiums are eaten. Then she uncovered a large salad bowl containing radishes, carrots, celery, and lettuce. The lesson went on from there and at the close, the salad bowl was passed around and each child enjoyed a radish, carrot or piece of lettuce.

The student who decided to talk to the children about teeth had an amusing time. She used pink and white drawing paper and on one sheet of pink paper she had drawn a broken-down picket fence and on the other a neat, even white fence. She then asked the children how many teeth they had, and of course they all started counting them. The answers to the question were varied, one little boy said he could find only eleven. Following this she passed a mirror around the class and everyone looked at his teeth. The response from the children was very frank, and some immediately connected what they saw with an even fence. The discussion which followed permitted the student to introduce the foods needed to build strong teeth as well as bones.

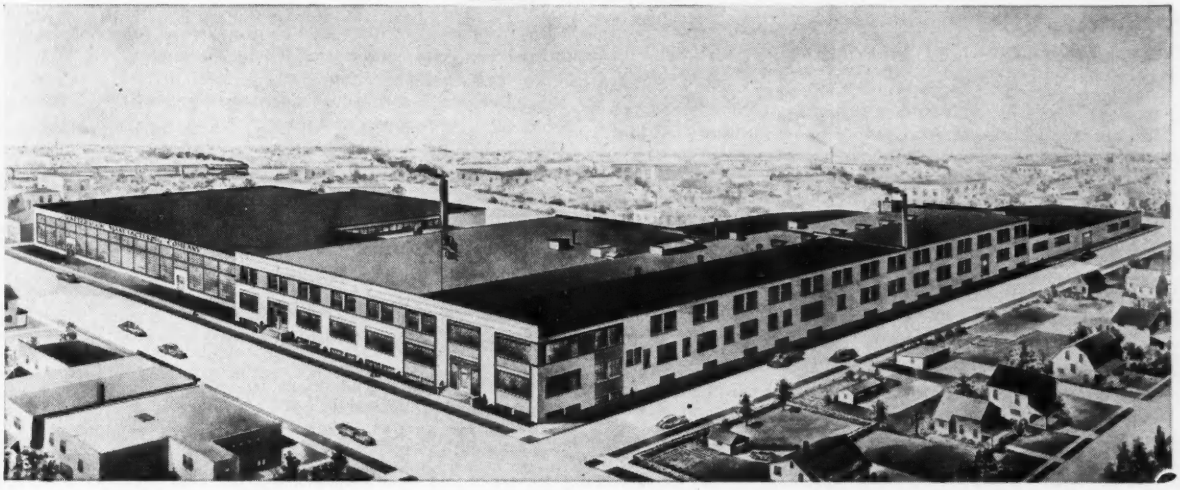
In order to make the student dietitian more aware of the opportunities for conveying nutrition facts to children and parents, a series of exhibits has been set up in one of the waiting rooms and a large show case with removable glass shelves provided. Again the students choose their own topics. Some topics have been seasonal. For Thanksgiving a moderately priced dinner was displayed. At Christmas a tree and cookies with recipes were exhibited. In April a small garden was planted and in May a market basket was shown. At present, there is an exhibit showing the feeding of children up to one year of age. This exhibit will be followed by foods for the 2 to 5-year-old and later, another showing foods and amounts for the adolescent child.

To summarize, I think the experiment has been worth-while for several reasons. First, the project was carried on because of the additional experience the student acquired in teaching children. This demands a different approach from that used in teaching student nurses, medical students, or graduate nurses. Second, and of greatest value, it was a

THIS IS WHERE IDEAS TURN INTO Ideal

FOOD CONVEYOR SYSTEMS

Found in Foremost Hospitals



Ever since 1884 the Swartzbaugh people have been developing new ideas and turning them into tangible things. It was that way through three wars, between wars, and is that way right now.

A well balanced staff of engineers and research men are hard at it every day. An idea gets a real work-out between the "Let's-do-it" lads and the "It-can't-work" graybeards. Out of a tangle of odd pieces of metal, wire, plastic and glass, friendly disputes, mock-ups and drawings, a better Ideal conveyor emerges.

Then the production people look it over and say "We can make that." Of course they can. They have everything from hydraulic presses, big as a house, to full grown machines no bigger than toys. And if they haven't got it they make it.

Whatever metal is best for the job in hand can be worked. The only question asked is—"Is it the right stuff?"

Of course the Swartzbaugh factory is big, streamlined and modernly mechanized. It is a fact that about twice as many people can produce five times the volume as was possible prewar. And not work as long or as hard, either.

Manufactured Exclusively by

THE SWARTZBAUGH MFG. COMPANY • TOLEDO 6, OHIO

Distributed by The Colson Corporation, Elyria, Ohio . The Colson Equipment and Supply Company, Los Angeles and San Francisco
In Canada: Canadian Fairbanks-Morse Company

means, not only of teaching children the basic foods, but indirectly of establishing better food habits. Third, many children who have been ill recover more quickly when a mental stimulus is supplied. We found them looking forward to the classes, which broke the monotony of hospital confinement for them. They were always interested and attentive and often expressed their appreciation.

Famine Emergency Committee Recommendations:

The President's Famine Emergency Committee, after an all-day meeting at the Department of Agriculture, issued on March 11 the following statement including specific recommendations for the conservation of wheat and wheat products and food fats and oils:

The world faces the gigantic emergency of famine among five hundred million people due to war exhaustion of agriculture and drought.

A great human cry has come to us to save them over a terrible four months until the next harvest. The Western Hemisphere alone has the aid to give, and a heavy part of the burden falls upon the United States.

These people can survive if we provide a minimum of bread and fats to them. Of breadstuffs, wheat can best be transported and used in the famine countries. Therefore we are asking our citizens to make a voluntary sacrifice of 40% of their consumption of wheat products and 20% of food fats and oils during this next 120 days.

For public eating places, we ask that they use no more than an average of 2 lb. of flour per customer per week. This means about 2 lb. of bread and ½ lb. of other wheat products. We ask that the service of food fats be reduced by 20%.

For householders, we simply ask that you reduce your purchases of wheat products by 40% and fats by 20%.

We have adequate food beyond what we must ship to meet the needs of the starving. Even if we send them every possible pound of wheat and fats, the quantity of food remaining in our country still will be greater than prewar. We are asking that all who can grow victory gardens, do so and thus help to assure continued abundance of food.

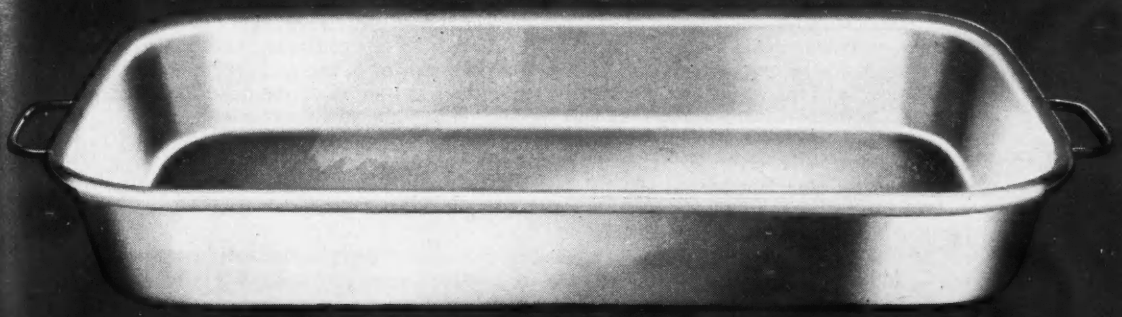
In order that there may be continued plenty of all other foodstuffs, we ask that there be no waste. America still throws away the richest garbage in the world.

To avert hunger, we cannot fail to meet this call. If we fail we shall see a world of disorders which will paralyze every effort at recovery and peace. We shall see the death of millions of fellow human beings. Guns speak the first word of victory, but only food can speak the last word.

The recommendations to food industries are based on suggestions received from representatives of these industries after their meeting at the Department of Agriculture March 7. The Famine Emergency Committee recommends that hotels, restaurants, dining cars, institutions, and others of the public feeding industry adopt the following as a program for the conservation and economical use of bread and fats and oils:

1. Discontinue during the emergency abroad the use of toast as a garniture with meat, poultry, egg, and other entrées.
2. Discontinue the practice of placing baskets of rolls and bread on dining room tables. A single roll or slice of bread should be served with the entrée, and later as requested.
3. Eliminate the custom of trimming toast and sandwich crusts.
4. Substitute open sandwiches for many closed or two-bread slice sandwiches in hotels.
5. Use potatoes in place of certain wheat and rice garnitures.
6. Single crust or open pies should be used in place of two crust pies whenever practicable.
7. Corn and buckwheat cakes should be served in place of wheat cakes where possible.
8. Serve oatmeal bread, cakes and cookies as alternates for products made from wheat.
9. The size of the roll made, the thickness of toast and bread should be reduced. Bread size could be reduced by not filling the pans as deeply as at present.
10. Substitute fruits and other desserts for pastries and cakes whenever practicable.
11. Limit the number of crackers in individual packages or served with soups, cheeses, etc.
12. Eliminate three-layer cakes for the period of the emergency.
13. Wherever possible induce customers to order only what is needed. Wherever side dishes are included in a meal, the customer should request only those side dishes and salads which he will eat.
14. Use boiled dressings instead of oil dressings on salads wherever possible.
15. Use alternates for wheat cereal wherever possible.
16. Encourage re-use of food fats and grease salvage.
17. Develop methods for saving and using the ends of bread, many of which are wasted at the present time.
18. Carry back all economies to employees' meals. Employees should cooperate to the same extent their customers are asked to cooperate.
19. Boil or broil rather than fry fish so as to save fats.
20. Eliminate serving of extra dressing for salads already prepared with oil or dressing.

THE HANDIEST PAN IN YOUR KITCHEN . . .

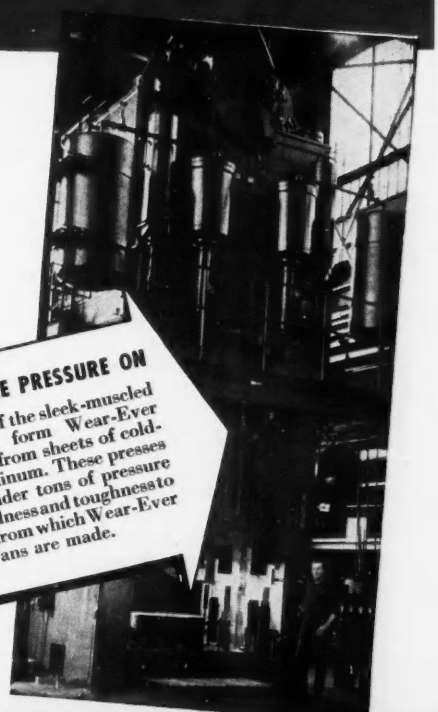


WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.

This jack-of-all-trades "Utility Pan"—made of friendly Wear-Ever Aluminum—is one of the most useful in any kitchen. It's ideal for roasting meats, for storing food in the refrigerator, for baking cakes, puddings, apples, and for preparing cold desserts.

In baking with this pan, foods cook to the center, evenly, because aluminum permits just the right distribution of heat. Roasts, also, have the lip-smacking appeal so indicative of uniform cooking.

Now made of a harder, stronger aluminum alloy than has ever before been practical for cooking equipment, this versatile Wear-Ever aluminum Utility Pan is designed for years of hard, faithful service. Plan now to let it simplify your kitchen routine. The Aluminum Cooking Utensil Co., 1304 Wear-Ever Building, New Kensington, Pa.



PUTTING THE PRESSURE ON

Here is one of the sleek-muscled giants that form Wear-Ever equipment from sheets of cold-rolled aluminum. These presses operate under tons of pressure—add hardness and toughness to the alloy from which Wear-Ever Utility Pans are made.

Made of the metal that cooks best . . . easy to clean

Now... MORE WEAR THAN EVER IN—

WEAR·EVER ALUMINUM

"The Dilemma That Is Bread"

Whether it would have been wiser for the Government to have adopted the reduction from base plan or the 80% extraction method to save 25,000,000 bushels of wheat for European relief is a question that may not be fully answered for several years.

. . . . It is perfectly understandable why the Government adopted the increased extraction plan, rather than the one desired by the industry. It feared the clamor, the criticism, the black markets that would arise were bread and baked goods—historically the most touchy of commodities—to become scarce. And were millers to be ordered to use, say, only 88% of the wheat milled in a base period, bread would be scarcer than at present. Even more important, the issue of blame would be clear-cut and definite for the thousands to whom the need for European relief is less important than finding a loaf of bread on the grocer's shelves at all hours of the day and every day.

Under the plan that became effective last Friday the millers and bakers—theoretically, at least—will have just as large stocks to offer as they have always had. But the onus will be upon the industry or industries.

Bakers will have the same amount of flour as always, but since, according to reports, it takes about 25% more sugar and shortening to produce acceptable baked goods, available supplies will be cut by that percentage. Were sugar and fats in plentiful supply, which they are definitely not, this criticism would lose its validity. But the disruptions, by no means, end here. Millers fearing possible public reaction against their products if the consumer does not like the new flour are dropping all brand names. Mixes, which have been growing increasingly important, will disappear, since they require flour of a "softness" superior to even the regular products sold before the new extraction ruling went into effect. The macaroni industry is also expected to suffer. Their revised products are expected to be tan in color with less eye appeal and, hence, less salability.

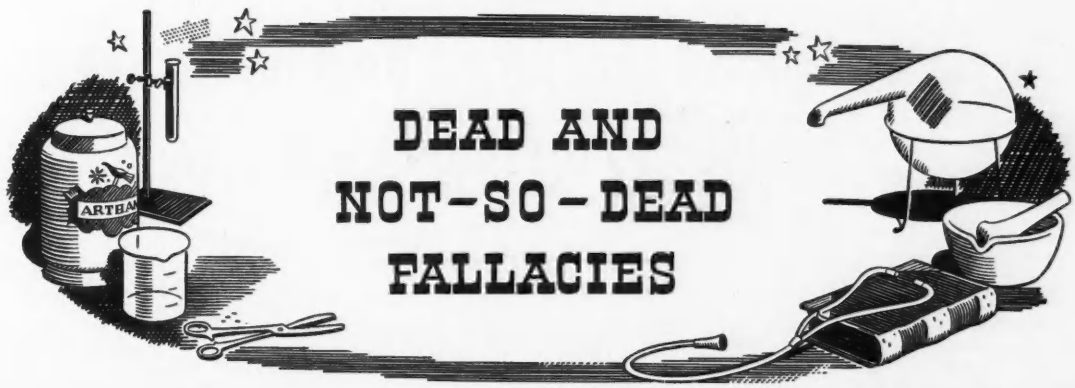
Here it might be pertinent to ask what effect this stoppage in promotion, this jolt to the citizenry's consuming habits, will have on flour consumption in the years ahead when it will be vitally important to have it remain high.

Perhaps even more important is the fact that the new extraction rate means the production of about 35% less animal feed—a product already in seriously short supply. With less feed, farmers are expected to feed wheat, thus to a degree nullifying the effect of the Government's program. What is more, increased feed scarcity will accelerate the tendency to reduce animals on the farm, with the full effect probably not ascertainable for several years.

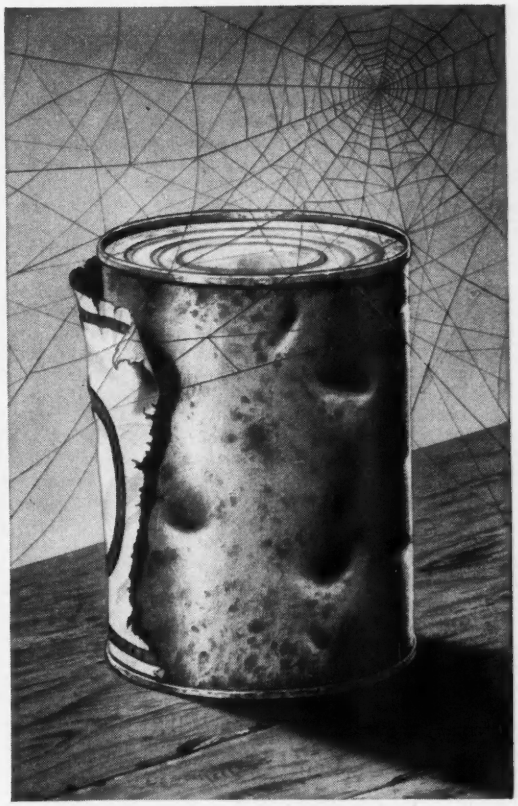
Considering all these factors, it appears that were the industry plan adopted, the disruptions would have ended as soon as the old milling rate could be restored. On the other hand, under the Government's programs the effects of additional wartime dislocations will be projected for a considerable period afterwards. For that reason the extraction rate solution may, perhaps, be charged with being just a shade opportunist.—*Editorial in Food Field Reporter, March 4, 1946.*

FAT REMINDER

Supplies of fat in this country are still short and the need for fat salvage is still urgent, according to USDA. The heavy demand for oils and fats for making soap flakes and laundry soap continues ahead of supply. Even though fat rationing is over, housewives and others can help by saving and turning in fat, as they did during the war, for which meat dealers still are paying 4 cents a pound.



Persons afflicted with rabies were once suspected of barking like dogs and biting anyone around them. Killing the animal which bit the victim of this disease was believed to be an effective cure.



The presence of rust on a can is looked upon by many today as a sign that the food it contains is contaminated. This, of course, is not true—unless the rust has eaten through the metal.

CANCO

AMERICAN CAN COMPANY

NEW YORK · CHICAGO · SAN FRANCISCO

NO OTHER CONTAINER PROTECTS LIKE THE CAN

Book Reviews

New Goals for Old Age. Edited by George Lawton. New York: Columbia University Press, 1945. Cloth. Pp. 210. Price $2.75.

This is a collection of papers originally delivered in a course, "Mental Health in Old Age," conducted under the auspices of the Section on the Care of the Aged of the Welfare Council of New York City during the year 1940–41. The subject of diet in old age is touched upon in two papers, the first of which refers to a report made in September 1942 by McCay, James, and Barnes of Cornell University, describing experiments on puppies which led the experimenters to believe that the normal span of life could be stretched considerably by the ingestion of a diet low in calories and high in quality. The second reference to diet is contained in the paper on physical changes in old age, by Lewellys F. Barker, in which a few general principles are outlined. The chief interest for the dietitian in this book is the excellent background it affords concerning the physical and mental factors which must be considered in dealing with older people.

A new science of bibliotherapy described as "psychological dietetics" is proposed by Alice I. Bryan, School of Library Science, Columbia University. This is another side of therapy suggested as necessary in treating the patient as a whole, and there would seem to be great possibilities in this field. Reference is made in the chapter to the National Research Council's recently established journal, *Psychosomatic Medicine*, and the book, *The Patient as a Person*, by Dr. G. C. Robinson of Johns Hopkins University.

The last chapter in the book is in reality an essay, written by a woman who is living in a home for the aged. The style is delightful and the content worth reading, and we are pleased to note that the author makes a bow to the dietitian as a donor, along with physicians and boards of health, of the "gift of a score or more of years than we were wont to expect."

White Versus Brown Flour. By F. L. Dunlap, Consulting Cereal Chemist. Published by Wallace & Tiernan Co., Inc., Belleville 9, New Jersey, 1945. Cloth. Pp. 272. No price stated.

According to the Preface, this monograph has been prepared primarily for cereal chemists and others more or less closely associated with, or interested in, the milling industry and its products. It also serves to bring information to others who may desire to know the pros and cons of a subject which has been a lively topic of argument for over a hundred years. The following subjects, some of which are admittedly collateral, are covered: composition of white and brown flour and bread, mass feeding with long-extraction flours, nutritional significance of bran, nutritional characteristics of white and brown flour, professional views on white *vs.* brown flour, biological values, the phytic acid problem in long-extraction flour, enriched flour and enriched bread, the amino acids in nutrition.

Sufficient ammunition for anyone wishing to argue either side of the question may be found in the chapter devoted to professional views. Most of the arguments in favor of white bread are familiar: it is not a perfect food, but no one food is, and any deficiencies in vitamins, minerals, or protein can easily be made up by other foods commonly found in a mixed diet; it is much better liked generally as evidenced by the fact, for instance, that after World War I people discarded the whole wheat flours in favor of white flour as soon as conditions permitted; it has better keeping qualities; it is more digestible—less bulky. Arguments pro and con the last-named feature are most interesting. Conflicting views concerning the digestibility of bread made in Britain from the National Wheatmeal are quoted, also a sly comment by Dr. Tobey about the bread advocated by Sylvester Graham in which he calls attention to the report that "the cause of the death of this ardent advocate of roughage in the diet was an intestinal obstruction." One writer is quoted as saying that if only one person in 100 finds a steady diet of whole wheat bread irritating, the medical profession cannot be expected to sanction its use generally, while another is reported as stating that it would be more humane to ask the few who need the laxative action of a wholemeal bread to take bran medicinally, if such be their choice of a laxative, rather than to expect others who do not have trouble to "be condemned to have bulky stools, in order that our constipated colleagues may have regular motions."

But one grows a little weary of these arguments. The book will be of interest to those who want the complete story of the long battle, based on copious references to the literature (indexed by author and-subject). In fairness to the millers who have been buffeted by the storm, it must be admitted that the whole question has been greatly aggravated by the work of the faddists. The book's final conclusion is sane and surprisingly unbiased, in view of the fact that the author has allowed the managing editor of *Northwestern Miller*, which has "championed white flour and bread against their traducers" to bestow his editorial blessing in the Foreword to the book.

Traditional Food Preparation Rules. By Dorothy Dickens. Bulletin 418, Mississippi Agricultural Experiment Station, State College, 1945. Paper. Pp. 60. No price stated.

The purpose of this report was to analyze 1499 food preparation rules taught to 1158 small town homemakers by their mothers or someone else in their parental home, as a basis for better understanding of food preparation practices now prevalent. About half of the white homemakers and eight tenths of the Negro homemakers gave the interviewers one or more food preparation rules which they had been taught. The rules reported were classified into five groups for analysis: (1) preparation rules which are in accord with practices now recommended by nutrition and food specialists; (2) preparation rules which are in accord with directions found in old cook books examined, but are now outdated because of increased knowledge of nutrition or better technical methods or changes in processing; (3) preparation rules which are in accord with observation but not found in old cook books examined which are now out-of-date because of increased knowledge of nutrition or better technical methods or changes in processing; (4) preparation rules

He doesn't think you know how to make a good cup of coffee!

How does your coffee rate with the patients?

If it is a full-flavored satisfying brew you rate cheers. For coffee means a lot to the average hospital patient. His appetite most likely is not up to par and he needs coffee's palate-tickling lift.

And there's really no excuse for poorly brewed coffee. A little attention to the brewing operation—be sure it's made full-flavored and fresh every time—and you can be sure of a delicious appetizing beverage that won't discourage finicky appetites.

Naturally coffee is only one item on the convalescent menu, yet it has a major part in keeping patients in a happy frame of mind. See that they get the kind that makes them look forward to mealtime!

LATEST COFFEE BREWING INFORMATION

For valuable up-to-the-minute coffee brewing information, write for the new leaflet, "Coffee—A Little Word On Your Menu." It gives detailed instructions on all methods of coffee brewing and care of equipment. To obtain this free leaflet, write Pan-American Coffee Bureau.

COFFEE

The Friendly Drink . . . from Good Neighbors

PAN-AMERICAN COFFEE BUREAU

120 Wall Street, New York 5, N. Y.

BRAZIL COLOMBIA COSTA RICA CUBA
DOMINICAN REPUBLIC EL SALVADOR
GUATEMALA MEXICO VENEZUELA

with the cooperation of

THE NATIONAL COFFEE ASSOCIATION

seeming to have little or no basis; and (5) preparation rules of the recipe type.

It is suggested that it is especially important in working with groups such as the older homemakers and those with less schooling, such as Negro homemakers, to learn everything possible about what the women have been taught and to use this information as a basis for a teaching program. The entire study is interesting, as it represents a new approach to the study of food practices, and many interesting traditional rules were brought to light during the course of the investigation which might be identical with or quite similar to those found in other sections of the country.

Microbiology for Nurses. By Charles G. Sinclair, M.D. Medical Corps, U. S. A. Sixth edition. Philadelphia: F. A. Davis Company, 1945. Cloth. Illustrated. Pp. 265. Price $2.75.

As stated in the Preface, the first edition was offered as a medium for giving a suitable perspective without burdening students with the frightening depths of the average medical textbook. Originally based on lecture and laboratory-guide notes, the book was revised from year to year as requirements and reactions of students were noted, during five years of classes in microbiology and pathology at the Army School of Nursing, and in similar classes for physiotherapy and occupational aids, and for dietitians at Walter Reed Hospital.

Part I contains an outline of microbiology and Part II presents laboratory exercises arranged and numbered to correspond with chapters in Part I. The early chapters begin with simple terminology, and a technical vocabulary is gradually added in order that later periods may be approached with a vocabulary and working knowledge of the subject well established. The laboratory sections prescribe simple exercises to be carried out by the instructor or the student, providing practical experience in support of the didactic work.

The book is liberally illustrated and includes a comprehensive index.

Medical Nursing. By Edgar Hull, M.D., and Cecilia M. Perrodin, R.N., Louisiana State University School of Medicine. Third edition. Philadelphia: F. A. Davis Company, 1945. Cloth. Illustrated. Pp. 641. Price $3.50.

As defined by the Committee to Outline a Definition of Nursing of the American Nurses' Association, "Professional nursing is a blend of intellectual attainments, attitudes, and manual skills based on the principles of scientific medicine, acquired by means of a prescribed course in a school of nursing affiliated with a hospital, recognized for such purposes by the state, and practiced in conjunction with curative or preventive medicine, by an individual licensed to do so by the state."

An important change in the present edition of *Medical Nursing* is the placing of greater emphasis upon the principles which determine good nursing practices in the care of medical diseases. The plan suggested is first to supply the student with accurate knowledge of the diseases, which forms the basis of the principles involved in nursing care, and then to evolve the principles and to discuss and exemplify their application. While a chapter is devoted to diseases due to deficiency of nutrition, and in some instances specific dietary treatment is recommended, greater coverage in the important subject of nutrition would undoubtedly have been possible had a dietitian been included as coauthor, as in the first edition of this book. The illustrations are excellent, the type is legible, and the makeup attractive.

Structure and Function of the Human Body. By Ralph N. Baillif, Assistant Professor of Anatomy, Louisiana State University School of Medicine, and Donald L. Kimmel, Associate Professor of Anatomy, Temple University School of Medicine. Philadelphia: J. B. Lippincott Company, 1945. Cloth. Illustrated. Pp. 328. Price $3.

According to the Introduction, this is "a concise, carefully organized presentation" emphasizing the relationship of structure and function of the body and written in simple language, the authors using a minimum of technical and scientific words and phrases. A further examination attests this. In the belief that most texts are too voluminous for efficient use in the time usually allotted to an introductory course, an attempt has been made to eliminate many factual details which are not essential for a basic understanding of the body as an integrated unit. Unit I consists of an introductory survey of the physical building units: cells, tissues, and organs, correlating their structure and function. Unit II covers the skeletal, muscular, and circulatory systems; Unit III, the digestive and respiratory systems; and Unit IV, the urogenital, endocrine, and nervous systems. An introduction to technical terms and their proper use is placed at the end of Unit I and a glossary is given at the end of the book. Numerous excellent illustrations will serve to fix the facts as presented in the mind of the student, and simplify his orientation to the sciences relating to the human body.

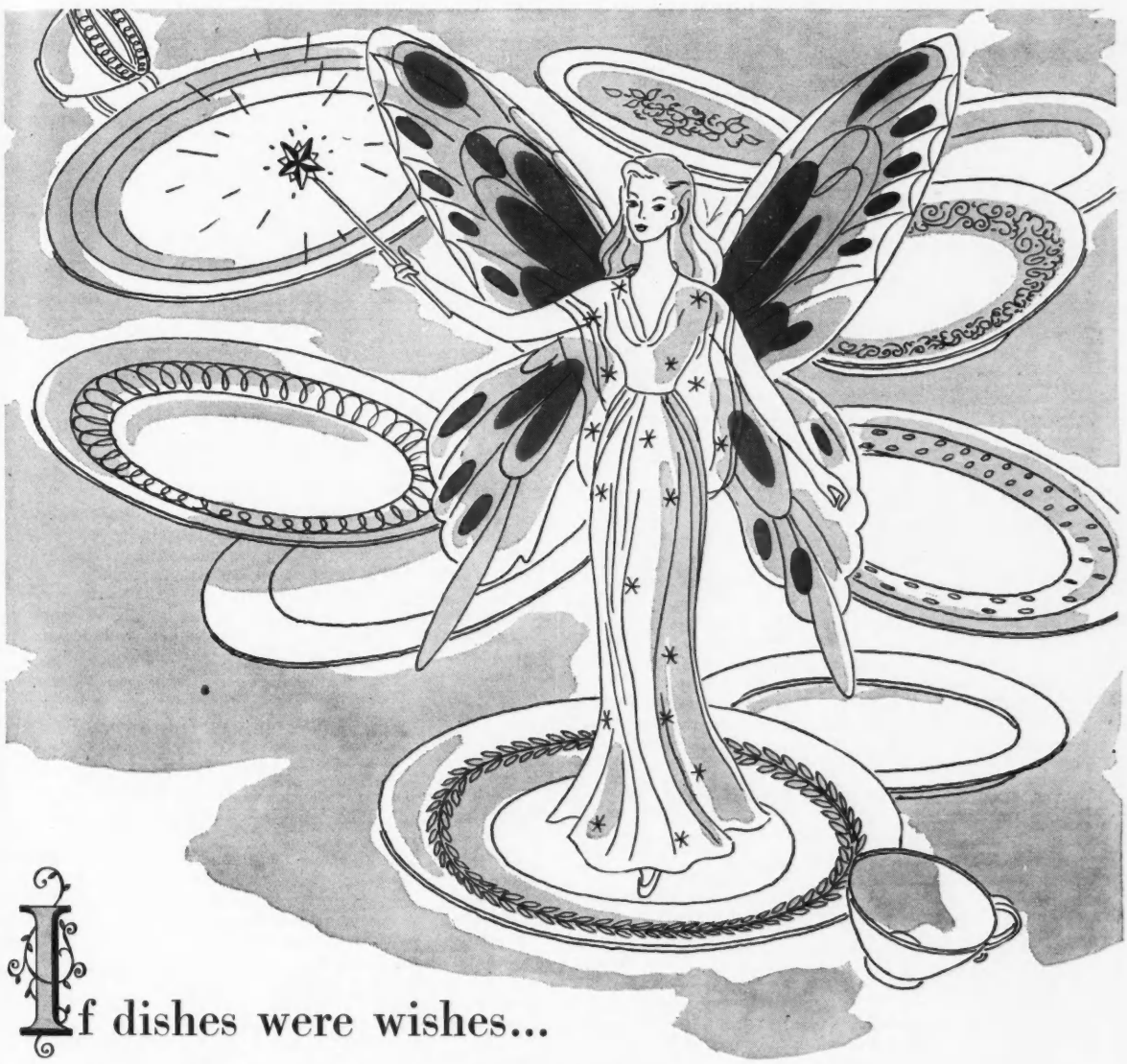
Statistical Methods: Applied to Experiments in Agriculture and Biology

By George W. Snedecor, Director, Statistical Laboratory, Iowa State College. Ames, Iowa: The Collegiate Press, Inc., 1946. Cloth. Pp. 485. Price $4.50.

"The beginner in experimentation too often finds himself supplied with a pair of elaborate mechanisms. In the one hand is a mass of data demanding simplification and interpretation, while in the other is a complex statistical methodology said to be necessary to research. How shall the two be geared together? Since the data can be only inefficiently utilized without statistical method, and since method is futile until applied to data, it seems strange that greater effort has not been made to unite the two. For those of some experience there are adequate texts and journal articles. It is the novice to whose needs this book is directed. It is hoped that he may be furnished with a smoothly working combination of experimental data and statistical method. . . . Data on golf scores, operations, and babies are arid indeed to the listener, but of absorbing interest to the narrator. We have endeavored to present the subject in a different aspect. Fundamentally, statistics is a mode of thought. Biometrics is a delineation of living things. While the mechanism of description is always likely to be tedious, the effort has been made to emphasize the subject portrayed rather than the technique of the portrayal."

Thus writes the author of *the* book on statistical methods, at least for the biologist. Incidentally, he encourages the wary scientist but lightly trained in mathematics, by assuring him that even so the statistical method can be absorbed by him, for "the conditions surrounding the mathematical theorems can be set forth in terms quite readily understood by the lay reader." This statement lends encouragement, if it does not fully convince. But if, by means of a study of this book others may be better able to emphasize the subject portrayed rather than the technique of the portrayal, then we say "amen, may the good work go on!"

Unquestionably, the book is a good Exhibit A in favor of the statistical method, judged by the author's ability to express himself with clarity, and now and then with the saving grace of a subtle and dry wit.



If dishes were wishes...

You wouldn't be troubled with washing problems. But since there's no good fairy in your kitchen to work magic with a wand your best bet is to use Wyandotte dishwashing compounds. They are *specialized*—each is made to do a particular job quickly and thoroughly.

The ideal cleaner for washing by machine is Wyandotte Keego.* It works in the hardest water . . . rinses freely . . . leaves no film behind.

Wyandotte H.D.C.* is for dishwashing by hand. Sudsy and containing soap, it's an effective water-softener and grease-remover.

Wyandotte Neosuds* is for glassware and light dishwashing.

Sudsy but soapless Wyandotte G.L.X.* excels at detarnishing silverware.

And for a safe, sure germicide, use Wyandotte Steri-Chlor* for rinsing fresh vegetables—also for dishes, glasses and silver.

A call will bring the Wyandotte Representative to talk over your dishwashing problems with you. Don't hesitate to ask his help at any time.

*Registered trade-mark

WYANDOTTE CHEMICALS CORPORATION • J. B. FORD DIVISION
WYANDOTTE, MICHIGAN • SERVICE REPRESENTATIVES IN 88 CITIES

Wyandotte
REG. U. S. PAT. OFF.

Current Literature

Contributed by Janet Engebretsen and Janette C. Carlsen, Dietary Department, Johns Hopkins Hospital; Quindara Oliver Dodge, Women's Educational and Industrial Union, Boston; and the Journal staff.

AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 211, January 1946

*Palmar erythema. H. H. Hecht and R. M. Johnson.—p. 79.

Palmar Erythema. It is not rare to find palmar erythema associated with pregnancy, cirrhosis of the liver, pulmonary tuberculosis, and rheumatoid arthritis. Palmar erythema is due to dilatation of the capillaries of the hands and feet; it is generally known to disappear when the causative factor is removed. For example, after pregnancy, the erythema usually clears up quickly. It occurs with equal frequency in both sexes. Hypo-albuminemia occurred in 85% of the patients who had palmar erythema and in only 62% of an unselected group of patients. Hypo-albuminemia is not regarded as a cause of palmar erythema but the finding of palmar erythema should suggest a protein deficiency.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 36, February 1946

Public health field experience. B. G. Horning.—p. 135.
*Restaurant sanitation in the South Pacific. K. D. Larson.—p. 147.
*Survey of the blood plasma levels of vitamin A, carotene, ascorbic acid, and tocopherols of persons in an area of endemic malnutrition. P. L. Harris, K. C. D. Hickman, J. L. Jensen and T. D. Spies.—p. 155.
*Outbreak of infectious hepatitis, apparently milk-borne. W. J. Murphy, L. M. Petrie and S. D. Work.—p. 169.

Restaurant Sanitation. The controlling of sanitation in civilian eating establishments can be accomplished by one of two methods: either by police enforcement of set regulations or by the usually more desirable method of education and cooperation. In the United States, a town which allows its restaurants to be operated in an insanitary manner can be put off limits, but on small islands of the South Pacific this is nearly impossible. Describes methods used under such conditions.

Endemic Malnutrition. In a survey of the distribution of vitamin A, carotene, ascorbic acid, and tocopherol concentrations in the blood of two groups of selected persons from the same locality, the "normal" persons had no symptoms, whereas the "clinic" patients all had symptoms but no diagnostic lesions. Findings suggest that it would be worth-while to administer vitamins A, C, and E, separately and under controlled conditions to determine the effect on the blood levels and whether or not there is an improvement in any of the symptoms.

Infectious Hepatitis. The evidence gathered during the course of this investigation, while purely circumstantial in character, points quite definitely toward a single milk supply as the source of the outbreak. The possibility of the outbreak being unrelated to the milk supply was apparently quite remote.

ANNALS OF INTERNAL MEDICINE

Vol. 24, January 1946

*Liver function in diabetes. S. J. Gray, W. Hook and J. L. Batty.—p. 72.

Liver Function in Diabetes. A group of 247 diabetics was divided in two sections: group A, a carefully controlled group in regard to diet, insulin and general care; group B, a poorly controlled group due to economic, social and intellectual status. Hepatic involvement was found much more frequently in group B; liver disease was found in approximately 50% of patients having severe diabetes. It is noted that failure to control the diabetic state results in a considerable increase in liver disease.

ARCHIVES OF INTERNAL MEDICINE

Vol. 76, November-December 1945

*Nutritional deficiency and cardiac dysfunction. M. M. Wintrobe.—p. 341.
*Blood. F. H. Bethell, C. C. Sturgis, R. W. Rundles and M. C. Meyers. —p. 358.

Nutrition and Cardiac Conditions. Although cardiac dysfunction has been associated with nutritional diseases for over 60 years, conclusive evidence is still lacking. This review will be confined to facts pertaining to beriberi in relationship to cardiac conditions. Pigs put on thiamin-deficient diets demonstrate well-defined changes. Abnormalities occurring in pigs were: shortness of breath, poor growth, weakness, cyanosis, and death. Whether the changes produced on thiamin-deficient pigs are the same as those which may occur in humans is not known; enough evidence is available to suggest that lack of thiamin will produce abnormal heart conditions.

Blood. This is a continuation of the review of the literature given in the journal for last month. Topics dealt with in this issue include: iron metabolism, experimental anemia, anemia associated with pregnancy, hemolytic anemia, toxic effects of industrial poisons and aplastic anemia.

FOOD RESEARCH

Vol. 10, November-December 1945

Constituents of crude carotene of carrots. A. R. Kemmerer and G. S. Fraps. —p. 457.
*Magnesium content of meats. V. Toscani.—p. 461.
*Nutritive value of canned foods. VII. Effect of commercial canning and short-time storage on ascorbic acid content of grapefruit juice. J. R. Wagner, M. Ives, F. M. Strong and C. A. Elvehjem.—p. 469.
*Plain butter cakes and baked custards made from spray-dried whole-egg powder. J. E. Ary and R. Jordan.—p. 476.
*Effect of steam and hot-water blanching on ascorbic acid content of snap beans and cauliflower. J. Retzler, F. O. Van Duyne, J. T. Chase and J. I. Simpson.—p. 518.

LOOK WHO'S HERE!

Dole Sliced Pineapple
for all kinds of salads, upside-down cake, and as a meat garnish

Dole Crushed Pineapple
for cakes, pies, ices, and dessert toppings

Dole Pineapple Chunks
for dessert "as is." Delicious in gelatine dishes and fruit cups

Dole Pineapple Juice
at mealtime or anytime, this true, unsweetened Juice of sun-ripened pineapples tastes so good

Yes, Dole Pineapple Products are returning to civilian life. As they become more available to the home-makers who read your pages, columns and booklets, attend your classes, and listen to your broadcasts, we trust that there will be occasions when you can discuss the many uses of Dole Pineapple Products —Sliced, Crushed, Chunks, and Juice.

Magnesium Content of Meats. Determinations on 71 samples of various cuts of meat show close agreement with the published data.

Grapefruit Juice. The retention of ascorbic acid during canning ranged from 92.2 to 99.6%, with the average retention for all plants, 96.7%. During subsequent storage for 40 days (average about 72°F.) samples of grapefruit juice retained, on the average, 91.3% of the ascorbic acid present in the freshly canned juice.

Butter Cakes and Custards Made With Egg Powder. Plain butter cakes and baked custards comparable in desirability to similar products made with fresh eggs can be made with good quality, spray-dried whole egg powders. A simple and time-saving mixing procedure which yields satisfactory cakes is to sift the egg powder with the flour and baking powder and add to the milk the water necessary for the rehydration of the egg powder.

Snap Beans and Cauliflower. Snap beans blanched by the hot water method lost approximately 15% of their ascorbic acid content during the blanching procedure and 20% during all the processes preparatory to freezer storage. Steam-blanched snap beans lost 11% during blanching and a total of 16% during the preparatory process. When ready for freezer storage, the cauliflower blanched by hot water was found to have lost 19% of the original ascorbic acid and that blanched by steam 18%. Both frozen vegetables showed a decrease in ascorbic acid content during storage. After 9 months of freezer storage, snap beans and cauliflower had lost approximately 60 to 70% of their original total ascorbic acid.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 130, January 26, 1946

*Cirrhosis of the liver. A. J. Beans.—p. 190.
*Nutritional anemias in children. Editorial.—p. 212.

Vol. 130, February 2, 1946

*Nocturnal gastric secretion. D. J. Sandweiss, M. H. Sugarman, H. M. Podolsky and M. H. F. Friedman.—p. 258.

Cirrhosis of the Liver. Twenty patients with cirrhosis of the liver and ascites were treated with a high protein, low fat diet supplemented by yeast and a combination of choline and cystine. Twelve of these patients with livers which were not enlarged showed no response to the therapy, whereas 7 of the 8 patients with large livers made a good recovery from liver decompensation. A comparison of the treated group of patients with large livers, with a similar group of 15 patients who were treated with only a high protein, low fat diet supplemented with yeast, indicated that the combination of choline and cystine had a favorable influence in the treatment of cirrhosis. The striking difference in the response of patients with large livers compared to patients with livers not enlarged suggests that the combination of choline and cystine is effective where fatty changes in the livers are suspected.

Anemias in Children. Recent observations again emphasize the importance of proper nutrition, especially with respect to protein, the B vitamins and iron, in maintaining normal hemoglobin formation in the growing child.

Nocturnal Gastric Secretion. Data on 150 night secretion studies conducted on both normal subjects and patients with duodenal ulcer indicate that both normal persons and patients with duodenal ulcer secrete acid gastric juice during the night, even when the 6 p.m. meal consists of foods usually allowed ulcer patients. Following a fairly well balanced meal at 6 p.m. (which included beef broth and fish) the nocturnal gastric juice from patients with duodenal ulcer is approximately of the same hydrochloric acid concentration as is the gastric juice from normal subjects of the same sex. Following this meal at 6 p.m. the nocturnal volume of gastric juice in patients with duodenal ulcer (as obtained by continuous suction) is on the average not greater than that of normal subjects of the same age and sex. When intermittent single aspirations are performed during the night (not continuous aspiration) a greater quantity of gastric juice is found in the stomach of duodenal ulcer patients as compared with that found in the stomach of normal subjects of the same sex. The greater volume is due, however, not to a state of hypersecretion but probably to a state of delayed gastric emptying. Only 1 of the 22 ulcer patients studied may be interpreted as probably having a tendency to gastric hypersecretion. More studies by means of continuous suction on both ulcer patients and normal subjects are essential before definite conclusions may be drawn. If hydrochloric acid is the chief factor in ulcer distress and delayed healing, it is essential that more attention be focused on the nocturnal phase of gastric secretion, regardless of how the patient "feels" during the night and regardless of the volume of gastric juice and concentration of hydrochloric acid. While ulcer patients may not secrete any more gastric juice or hydrochloric acid than normal persons, the data indicate that ulcer patients retain more of the juice and acid in their stomachs at any one time. During the night, therefore, the free hydrochloric acid in the stomach may undo in part what neutralization accomplishes during the day when the food in the stomach performs its neutralizing and acid-adsorbing power. Feedings during the night are therefore essential. When meat and fish are added to the diet of ulcer patients it is advisable to include these foods during the noon meal instead of during the evening meal. When the noon meal (instead of the evening meal) includes these foods, the stomach contains less free acid during the night.

JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 162, January 1946

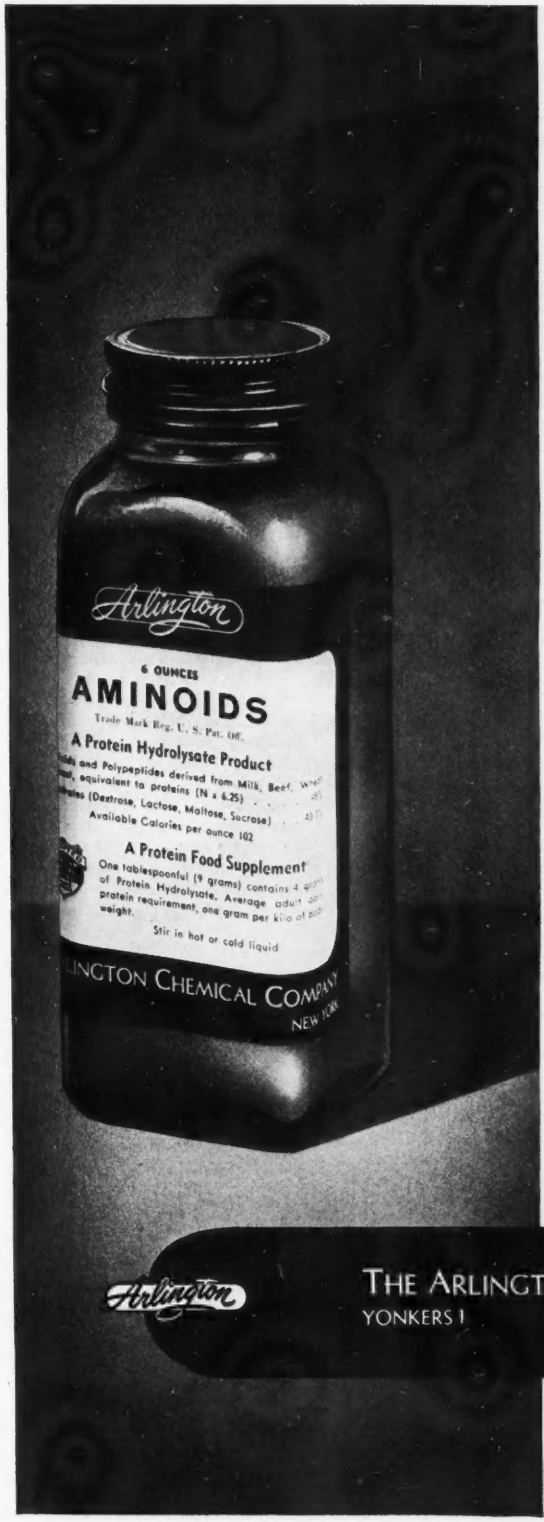
*Dietary factors in the regulation of liver lipid concentration. P. Handler.—p. 77.
*The effect of the preceding diet upon fasting ketonemia. H. C. Tidwell and C. R. Treadwell.—p. 155.

Vol. 162, February 1946

*The effect of riboflavin deficiency upon carbohydrate metabolism in anoxia. M. E. Wickson and A. F. Morgan.—p. 209.
*The influence of diet on the riboflavin metabolism of the rat. J. W. Czaczkes and K. Guggenheim.—p. 267.
*Studies in carbohydrate metabolism. VI. Effects of hypo- and hyperinsulinism in rabbits. DeW. Stetten and B. V. Klein.—p. 382.

Liver Lipid Regulation. The administration of biotin plus a basal B vitamin supplement to rats previously fed a low protein diet with no B vitamins resulted in fatty livers despite the presence of adequate amounts of dietary choline. This was accompanied by a considerable increase in food consumption and growth. The further addition of folic acid accentuated these phenomena, although folic acid without biotin did not produce these effects. Inositol prevented the accumulation of liver fat without affecting either appetite or the growth rate. When a relatively high fat diet plus the basal B vitamin supplement was given to previously depleted rats, inositol was again found necessary to maintain normal liver lipid concentrations even in the absence of supplementary biotin, folic acid, or liver extract, and the effects of biotin plus folic acid were even more pronounced on this diet.

Diet and Fasting Ketonemia. Various dietary levels of fat, ranging from traces to 63% of the preceding diet, or changes in the fat from 38 to 83% of the caloric intake, with protein intakes the same, produced no significant differences in the blood ketone levels during the following fasting periods. Low protein intakes were associated with a following fasting ketosis significantly higher than that after the ingestion of 1 gm. or more of protein per day for each 100 gm. of body weight. The preceding protein intake appears to be the major dietary factor affecting the degree



Palatable

PROTEIN HYDROLYSATE

When protein supplementation is necessary, palatability of the therapeutic agent is an important factor.

The palatability[1] of AMINOIDS* has been demonstrated by ample clinical use. AMINOIDS blends tastefully with hot or cold liquids, and with numerous light foods, adding a distinctive flavor to puddings, custards, cereals, etc.** Palatability, plus avoidance of monotony, promote continued acceptance by the patient.

AMINOIDS, a protein hydrolysate product prepared by enzymatic digestion of beef, wheat, milk and yeast, contains the amino acids known to be present in these four high quality foods. AMINOIDS is readily absorbed from the digestive tract.

SUPPLIED: In granular form, in bottles containing 6 oz. One tablespoonful t.i.d. provides approximately 12 grams of protein as hydrolysate.

Aminoids

REG. U. S. PAT. OFF.

A PROTEIN HYDROLYSATE PRODUCT

For Oral Administration

ACCEPTED AMERICAN MEDICAL ASSN. Council on Foods and Nutrition

Arlington

THE ARLINGTON CHEMICAL COMPANY

YONKERS 1 NEW YORK

*The word AMINOIDS is a registered trademark of The Arlington Chemical Company.

1. Wilensky, A. O.: Surg. Gynec. Obst. 80:323 (Internat. Abst. Surg.) May, 1945.

**Recipe pads available on request.

of the following fasting ketonemia. The effect of the preceding intake upon the fasting ketosis can be explained by an increased utilization of carbohydrate in the animals on a low protein diet as well as by a lack of anti-ketogenic material during fasting due to the absence of sufficient protein stores.

Riboflavin Deficiency in Anoxia. Rats deficient in riboflavin could not increase their liver glycogen levels, when exposed to low oxygen tension, to the same degree as normal animals. This inefficiency was not due to the lower food intake of the deficient animals, nor to any permanent structural change. Injection of riboflavin into the deficient animals just before the exposure period began permitted normal response to low oxygen tension. The riboflavin content of the rat livers varied with the riboflavin intake. Riboflavin is indispensable for the operation of the glyconeogenic mechanism that is stimulated by anoxic anoxia, and may be involved in both glucose and glycogen formation.

Riboflavin Metabolism. Rats kept on a low protein diet showed a relatively large excretion of riboflavin in the urine, and were unable to retain riboflavin in their organs. Rats kept on high protein and high fat diets needed at least twice as much riboflavin as rats kept on the "normal" diet for the maintenance in the organs and urine of an equal level of riboflavin. Rats on low fat diets needed only about half as much riboflavin. The different requirements for dietetic riboflavin of rats kept on different diets have been shown to be due to differences in the amounts of riboflavin which are synthesized in a form available to the organism in the intestines.

Carbohydrate Metabolism. In the alloxan-diabetic rabbit, as previously shown to be true for the alloxan-diabetic rat, the rate of lipogenesis is well below normal. This is interpreted as a specific example of the more general impairment of glucose utilization in this condition. The glycogen deposited in muscle and in liver in the rabbit in response to insulin has been shown to arise chiefly by fairly direct processes from dietary glucose. When insulin is administered to a normal rabbit, a large increase in the rate of hepatic lipogenesis has been observed.

JOURNAL OF NUTRITION

Vol. 31, January 10, 1946

*The determination of metabolic fecal nitrogen and protein digestibility. D. K. Bosshardt and R. H. Barnes.—p. 13.

The thiamine, riboflavin, nicotinic acid and pantothenic acid content of colostrum and milk of the cow and ewe. P. B. Pearson and A. L. Darnell. —p. 51.

*Vegetable crops in relation to soil fertility. IV. Nutritional values of New Zealand spinach. S. H. Wittwer.—p. 59.

Protein Digestibility. A method for determining the "true digestibilities" of the proteins of whole egg, wheat gluten, and casein is described. The average "true digestibilities" determined by this method were: casein 98.3 ± 0.1%, wheat gluten 98.3 ± 0.3%, and extracted whole egg 91.5 ± 0.6%. When the food intake of mature mice was restricted to approximately 30% of the normal caloric requirement the average "true digestibility" of extracted whole egg was found to be 95.4 ± 0.2%.

New Zealand Spinach. "New Zealand spinach is at the bottom of the list of green leafy vegetables insofar as its vitamin C and calcium contributions are concerned."

MILBANK MEMORIAL FUND QUARTERLY

Vol. 24, January 1946

*Accuracy of hemoglobin determinations on finger-tip blood. D. G. Wiehl. —p. 5.

*Vibration sense and fatigue. G. Keighley.—p. 29.

An instrument for measurement of vibration sensation in man. G. Keighley. —p. 36.

Fingertip Blood. Variations in values obtained in determinations by the photoelectric method, one of the most accurate methods, are analyzed. The error of the procedure found for repeated determinations of the same blood specimens and the sampling variation for independent fingertip blood and venous blood are reviewed.

Vibration Sense and Fatigue. Two experiments were conducted in which vibration sense was measured in terms of the number of seconds that the subject could feel the vibration of a tuning fork of 128 cycles per second, held between two fingers. Nine persons doing laboratory or secretarial work were tested on 5 or more days at 9 a.m. and after 4 p.m. In the other experiment, 22 men went without sleep for four successive days. The average threshold for vibratory sense was not significantly different in the morning and late afternoon for the first group, and the mean threshold for the second group did not change significantly after four days without sleep. Thus, there was no evidence that fatigue modified the vibratory sensation of these subjects.

AMERICAN COOKERY

Vol. 51, January 1946

*A glossary of cooking terms. F. Schroeder.—p. 36.

*Food makes a difference—a nutrition program for employees. T. E. Boden. —p. 38.

Cooking Terms. *Burgoo*, originating in Walloon, Belgium, probably refers to a porridge or gruel; *canard à la presse* is a French method of preparing duck; chicken à la king was first made in England for an American; the word "fry" comes from the Middle English, meaning to roast or parch—today this method of cooking is one of the most misused; the word "spoon" is thought to have come from the Anglo-Saxon word *spon*, meaning a chip or splinter; the spoon is known to be the oldest eating implement; wassail is closely associated with New Year's and Christmas and means a greeting toast and a drink.

Nutrition Program. All during the war the adequacy of diet was stressed and discussed. This widespread interest led the Bell system to start an educational nutrition program for executives and employees. Various means were used to get in touch with all their employees and give all of them the same advantages. This course was very successful and led to many suggestions from employees for improving cafeteria food as well as an improvement in their nutritional habits.

BAKER'S HELPER

Vol. 84, December 29, 1945

*Homogenized whipped cream as a sugar-shortening saver.—p. 54.

Vol. 85, January 12, 1946

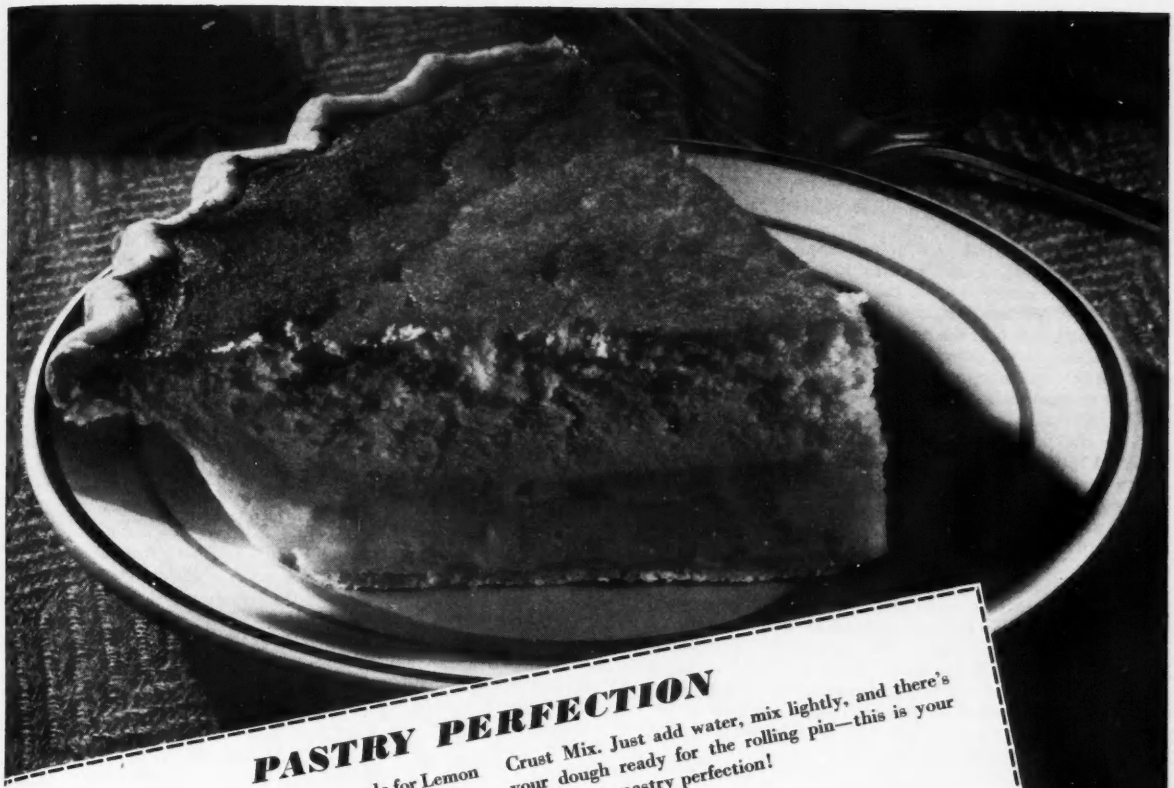
*Psychological effects of eye and flavor appeal. W. Schweisheimer.—p. 32.

*Training first, then apprenticeship. H. F. Schudlich.—p. 34.

*How to prepare refrigerated sweet doughs. K. C. Den Dooven.—p. 78.

Homogenized Whipped Cream. If homogenized cream is used, the baker can save his sugar and shortening. It is economical and there is no way to tell the difference between this and the natural cream. Taste and appearance are the same. Homogenized cream has a richer taste and whips better. It can be made richer by increasing the butter fat content.

Scoring Breads, Cakes, and Icings. Appetites are stimu-



PASTRY PERFECTION

Turn your pastry chef loose on this formula for Lemon Sponge Pie. Customers will like it—and the tender, flaky crust comes easy with Pillsbury's H&R Pie Crust Mix. Just add water, mix lightly, and there's your dough ready for the rolling pin—this is your short cut to pastry perfection!

LEMON SPONGE PIE

*Amount for Approximately 96 Servings**

Ingredients	
H & R Pie Crust Mix	5 pounds
Cold water	2¼–2½ cups

NOTE: This dough is improved if allowed to stand in refrigerator for four hours or more.

Directions

1. Put H & R Pie Crust Mix in large bowl; add cold water and mix lightly.
2. Roll dough to ⅛-inch thickness. Do not stretch dough when lining pie tin.

Ingredients	
Table fat, soft	18 ounces
Sugar	4½ pounds
Pillsbury H & R All-Purpose Flour	9 ounces
Salt	1½ ounces
Egg yolks	2 cups
Lemon juice	3¾ cups
Grated lemon rind	4½ tablespoons
Milk	5¼ quarts
Egg whites	3 cups

SUGGESTED VARIATION: Lime or orange juice may be substituted for lemon.

Directions

1. Cream table fat; add sugar, flour and salt and mix until smooth.
2. Add egg yolks and beat well.
3. Add lemon juice and rind; add milk slowly and mix well.
4. Fold in stiffly beaten egg whites.
5. Pour into pastry lined pan.
6. Bake in hot oven (400° F.) 30 to 40 minutes, or until lightly browned.

*Yield: 3 gallons, 1 quart to a pie; 12 pies (8 cuts to a pie) 96 servings

Approximate cost per serving—.042

For menu tip-ons and recipe card see your jobber or write us.

PILLSBURY MILLS, Inc. HOTEL AND RESTAURANT DIVISION
General Offices: Minneapolis, Minn.

COPYRIGHT 1946, PILLSBURY MILLS, INC., TRADE-MARK REG. U.S. PAT. OFF.

PILLSBURY'S H AND R HOTEL RESTAURANT

H&R Pie Crust Mix
H&R Biscuit Mix
H&R Cake Donut Mix
H&R Corn Muffin Mix
H&R Bran Muffin Mix
H&R Sweet Dough Mix
H&R Coffee Cake Mix
H&R Buckwheat Pancake Flour
H&R Pancake Flour
H&R Waffle Mix
H&R Chocolate Cake Mix
H&R Lemon Gold Cake Mix
H&R Spice Cake Mix
H&R Sno Sheen Cake Flour
H&R All-Purpose Flour

lated by appearance and aroma of a product. Flavoring is a necessary stimulant to digestion. If a food is not appetizing, the appetite is restricted and the food less digestible. Describes a scoring system for breads, cakes, and icings. Cakes should be scored before they are iced since the garnish covers up the defects.

Bakery Training. In the early days of the commercial baking industry, little attention was paid to the cost control system in use today. Prices were based on competition, not on cost of material and labor. Apprentices received almost no recognition and worked for a minimum wage. Guesswork was resorted to in baking. There was no uniformity in dough temperatures. Water was tempered by the sense of touch and the maturity of the doughs judged by the volume of the dough, not by the time element. An effort has been made to introduce bakery training in schools. Other industries train their people first and then they serve an apprenticeship period. The bakery industry is trying to follow this practice.

Refrigerated Doughs. Recipes for refrigerated sweet doughs are given. The refrigerating unit must maintain a temperature between 35 and 38°F. Humidity control must be kept at 80°F. or more to prevent the dough from drying out and crusting. If the mass of dough is very bulky, it will take longer for cold to penetrate and the yeast action is retarded. Retarded sweet doughs may be kept for 48 hr., but the best results are obtained when he'd 12 hr. or less. Straight doughs are conditioned from 10 to 15 min. before being placed in a proof box with steam. Best results are obtained from pieces made from the rolled-in sweet doughs if the pieces are first allowed to proof in the box without steam after they come out of the refrigerator, held in the box for a few minutes, then placed in the steam box for 10 min. just before baking.

FOOD INDUSTRIES

Vol. 18, February 1946

*Control of microbiological food spoilage by fumigation with epoxides—Part II. R. Whelton, H. J. Phaff, E. M. Mrak and C. D. Fisher.—p. 84.
*Does instinctive appetite correct science? B. D. Ingels.—p. 87.
*Quality control of precooked frozen foods. B. L. Hutchings and C. F. Evers.—p. 94.
*"Orange juice"—words, orange juice—the thing. B. C. Baum.—p. 101.

Fumigation With Epoxides. The use of ethylene oxide to control microbiological spoilage in unsulfured dried fruits proved successful. Propylene oxide shows promise. The nature of the toxic residue left on fruit by these fumigants is discussed.

Instinctive Appetite. This author states that when it comes to the important instinctive appetite, few nutritionists give it any consideration whatever, when humans are involved. "Fundamental as instinctive appetite is to the life of infants and animals, students of nutrition usually fail to apply the lessons that might be learned, to everyday menus. On the other hand, some nutritionists are greatly perplexed because a product, which according to their analyses and experience contains most desirable and important nutritive constituents, fails to be accepted by the general public. Millions of dollars have been spent trying unsuccessfully to get the peoples of the world to eat products containing soybean flour and soybean grits. What has instinct to do with this wanton waste of precious food in these times of scarcity? For more than 100 years, some doctors, food faddists, nutritionists, millers, and bakers have been using every device at their command to induce people to eat whole wheat bread, rather than white bread. Despite all this intensive promotion, the actual sales of such whole wheat products have not been more than 2% of the total white flour produced. Again the question arises: What has this to do with human instinct? Fortunately, in the case of whole wheat, there is now available some evidence which seems to bear out the soundness of the reaction of the instinctive appetites of millions of people. Will food chemists and others interested in good health and proper food make as vigorous a search for undesirables as has been made in recent years for nutritional benefits?"

Quality Control of Frozen Foods. These two authors, both of the Birds Eye-Snider Laboratories, New York, state that true control of quality includes responsibility for plant sanitation, surveillance of the health and cleanliness of personnel, selection of top quality raw materials, adequate sorting, washing and trimming of the raw materials, correct temperatures and timing of processing, proper packaging materials and methods, and last, but not least, correct freezing techniques and storage. The neglect of any one of these factors can notably lower the final quality of the pack. The length of time a cooked food can be held after it is removed from freezing storage is also of special significance. Improper handling that permits products to become thawed and then refrozen after they have once defrosted is a direct approach to the encouragement of bacterial growth. It is in the experimental kitchen that standard products can be weighed and measured and finally accepted or rejected. The accepted standards should then be used as a continual check on all future production. This is a field wide open for experimentation. The adaptation of colloidal chemistry to the proper procedures of food preparation and the freezing process is an essential part of the experimental work yet to be accomplished in the kitchen and laboratory.

Orange Juice. Tells why current standards for concentrated orange juice do not tell the whole story. The Brix reading of a concentrate does not reveal the strength of the fresh orange juice.

FORECAST

February 1946

*Packaged perishables. J. McClellan.—p. 38.
*Buying and cooking meat for quantity food service. J. A. Cline.—p. 41.

Prepackaged Foods. Careful and conscientious packaging of fresh fruit and vegetables is giving housewives confidence in the products. The old suspicions of the strawberry box "pretty on top" and "spoiled at the bottom" are being replaced with trust for these better foods—good all the way down. Cellophane packaging prevents considerable waste and benefits the grower, the food dealer, and the consumer.

Meat Buying and Cooking. The best guides to wise meat buying include: the inspection stamp, the grade stamp, the appearance of the meat and other indications of quality, the method of cookery desired, and the serving value. Best guides to the proper handling and use of meat are: proper storage temperatures, knowledge of the principles of meat cookery, and use of temperature control in cooking. All of these points are elaborated and some of them illustrated in this article.

HOTEL MONTHLY

Vol. 54, January 1946

*Dining car to make its bow, all-electric.—p. 40.
*Cook's school started in Canadian hotel.—p. 44.
*Lamb shoulders make profitable dishes.—p. 46.
*Cooking courses for Chicago schools.—p. 54.

All-Electric Dining Car. Electric kitchens, modeled after those installed in submarines, are being designed for dining cars. The entire installation will be powered with electricity—ranges, broilers, bake ovens, deep fry kettles, dishwashers, griddles, and coffee makers. An example of the increased efficiency that is possible with the new electric

What's Wrong with American Diets?

In too many American homes, breakfast is the "stepchild" meal. This fact is emphasized by the following figures taken from the Pennsylvania State College study of the breakfast eating habits of 5,000 people.

	Per cent of people eating no breakfast or only a meager breakfast
All people in the study.	22.4%
Non-Metropolitan urban families (wide range of income).	23.5
Small town urban families (medium income).	32.1
Rural families, engaged in farming (high to medium income).	1.5
Rural families, engaged in farming on medium to poor land (medium to low income).	5.7
Rural families, engaged in farming and chicken raising (medium incomes).	5.4
Metropolitan children and family members (wide range of income).	24.7
Grade school children, industrial non-metropolitan, chiefly American descent (medium to low income).	23.0
Grade school children, industrial non-metropolitan, large proportion foreign descent (medium to low income).	26.2
Grade school children in college community (medium incomes).	6.5
Grade school children in rural village (medium incomes).	12.1

According to this study those who ate no breakfast or only a meager breakfast were found to be nutritionally inferior to those who ate an adequate breakfast. Bulletin covering complete study available free. See coupon below.

VALUE OF HOT RALSTON IN AMERICAN DIETS

In many cases one serving of hot Ralston whole-grain wheat cereal can mean the difference between an inadequate and an adequate diet. More than twice as rich as natural whole wheat in wheat germ—richest cereal source of thiamin—Hot Ralston is also a good source of carbohydrates, iron, niacin and supplies protein, fat, fibre, copper, manganese, phosphorus, riboflavin and calories.

***FREE!* NUTRITION MATERIAL**

SEND COUPON FOR THIS HELPFUL FREE MATERIAL: Cereal Quantity Recipes to Serve 6 or 50; Teaching Kit on Cereal Grains including student pamphlet, whole wheat wall chart, adequate diet wall chart; Pennsylvania State College bulletin quoted above.

Ralston Purina Company, Nutrition Dept.
15F Checkerboard Square, St Louis 2, Missouri

Please send, no cost or obligation, material checked below.
- ☐ C845 Pennsylvania State College Bulletin
- ☐ C1868 Quantity Recipes to Serve 6 or 50
- ☐ C358 Teaching Kit on Cereal Grains

Name_____
Title or Position_____
Hospital or Organization_____
Street_____
City_____ Zone_____ State_____

(Offer limited to residents of continental United States)

equipment is found in the automatic fry kettle which occupies about 2 sq. ft. of floor space, yet turns out more than 100 lb. French fried potatoes, fried chicken, or other food per hour. Another innovation is the flameless broiler, installed in wall cabinets at eye level; also the base cabinets for storage below working surfaces; and the automatic dish-washing machines. Subzero food-holding compartments, making possible the handling of frozen pastries, fruits, vegetables and other provisions, will be used on dining cars for the first time when the all-electric cars are put in service. All heavy preparation work will be done at the commissary. Floor plan and elevation drawings are included in the article.

Apprentice Course for Cooks. Canada formerly secured most of its trained personnel for kitchen work from European countries. Recognizing the seriousness of the problem of training its own supply of cooks and chefs, the Canadian Pacific Railroad has established the first of a series of apprenticeship schools to train young boys in the profession of cooking. The course is to be for two years. The young men will spend varying lengths of time assisting in each kitchen department, learning the duties of: breakfast cook, butcher, pastry cook, baker, roast, grill and fry cook, and the different ways of preparing vegetables, cold dishes, salads, dressings, soups and sauces.

Lamb Shoulders. Lamb chops are easy to sell, but unfortunately there are not enough of them on each lamb to supply the demand. Roast shoulder of lamb is easy to prepare and serve. Serve it piping hot and do not prepare too far ahead of service. Illustrations accompanying this article show how to bone and roll shoulder of lamb, and how to serve.

School of Cookery. For some years the Washburne Trade School in Chicago has offered courses in cooking, but through lack of coordination and proper interest by all concerned, they have not been developed as they should have been. Now, through the work of Arnold Shircliffe, and a committee made up of representatives from hotels, restaurants, clubs, hospitals, dining cars and airlines, the Board of Education has appropriated a substantial sum to create a new School of Cooking that will have proper facilities for training young men to enter this profession. At present much attention is being given to the training of veterans in the trade schools. The youth of Chicago, when they graduate from high school, can go right to the trade school for their professional education.

INSTITUTIONS

Vol. 17, November 1945

*Glass washer and sterilizer.—p. 5.
*Roll and food warmers.—p. 14.
Plastics in institutions.—p. 40.

Glass Washer and Sterilizer. With a new machine, manufactured by The Lofstrand Co., Silver Springs, Md., glasses are not touched after entering the machine until ready to use. Bacterial count for glasses washed in this machine is no higher than 12 and as low as 0 per glass. Since it will wash 1600 glasses in an hour, it is economical. The machine saves on labor, glass breakage, and detergents.

Food Warmer. An electric food warmer, manufactured by McGraw Electric Company, Elgin, Ill., keeps food hot for hours, and prevents food from drying out or becoming soggy. Made of stainless steel, it will give years of good service.

JOURNAL OF HOME ECONOMICS

Vol. 38, February 1946

*Pressure cooker gauges and food spoilage. E. J. Thiessen.—p. 85.
*Effect of the war on food habits in Hawaii. K. B. Gruelle.—p. 91.
*The diet at a hostel in India. K. Hoffman and C. B. Warner.—p. 95.

Pressure Cooker Gages. To determine the accuracy of pressure cooker gages used by homemakers of Wyoming, records were kept of the degree and extent of the inaccuracies of those tested and also of the type and age of the cooker and gage. Data concerning the amount of service obtained from both gage and cooker, and in regard to canning practices and spoilage of canned food, were secured by means of questionnaires filled out by the homemakers in return for the testing service. Findings of the survey indicate that gages should be checked for accuracy once a year before the canning season starts and that those inaccurate to the extent of 2 lb. or more should be replaced by new ones. Since a gage costs comparatively little, replacement is better than trying to adjust or repair the old one, as some of the parts may be badly worn. A gage should be accurate to within ½ lb. per sq. in., at least 2 in. in diameter for easy reading, and have the scale marked in 1 lb. per sq. in. divisions. Postwar pressure cookers should be equipped with a type of gage or thermometer which will record temperatures accurately over a long period. The cooker should be so constructed that worn parts may be easily replaced, preferably by the owner.

Food Habits in Hawaii. As a result of educational programs and demonstrations, including Red Cross nutrition and canteen classes, the Food for Freedom campaign and programs of the Agricultural Extension Service, Health for Victory classes, adult education classes in the Department of Public Instruction and Y.W.C.A., also educational work of the territorial nutrition committee, the Board of Health nutritionist's educational talks and demonstrations, radio broadcasts and newspaper articles by members of the University of Hawaii Home Economics Department, and other activities, food habits in the Territory of Hawaii have been changed considerably since Pearl Harbor. Because of the lack of dried mushrooms, canned bamboo shoots, and other foods of low food value, women of Oriental ancestry have come to use more green vegetables. Many families now have home gardens and are producing and preserving more of their own foods. They also have grown accustomed to a greater use of inland-grown fruits and vegetables, rather than imported ones. Tastes have become more cosmopolitan, and all nationality groups have learned from each other. The value of lessons learned in wartime far outweighs any inconveniences or temporary food shortages, in the opinion of the writer.

Diet at a Hostel in India. Women students at the Agricultural Institute at Allahabad, India, receive practical training in nutrition through planning their hostel menus and purchasing the food as well as through overseeing the preparation of food. Food consumed by each student at the Women's Hostel, Agricultural Institute, for one day in September 1944 included: whole wheat flour 9.5 oz., vegetable fat and oil .5 oz., rice (raw milled) 2 oz., white granulated sugar 1.4 oz., unrefined sugar (jaggary) .48 oz., milk 1.9 oz., red gram 2 oz., Bengal gram .5 oz., black gram .5 oz., pumpkin 5.2 oz., "ladies' fingers" (okra) 3.6 oz., dried onions .48 oz., dried mango .07 oz., karonda .3 oz., spices .2 oz. Four meals a day were eaten, as follows: early morning tea: whole wheat unleavened bread (*chapati*) with vegetable shortening, tea with milk and sugar; breakfast: boiled rice, red gram (*arhar ki dal*), pumpkin (*bhujia*), whole wheat *chapati;* tea: whole wheat *chapati* with molasses, tea with milk and sugar; supper: mixed pulses, "ladies' fingers," whole wheat *chapati*. Figures on weight losses or gains of the students were not available, but girls who were very thin at the time of arrival tended to gain slightly or remain stationary and the few overweight ones to lose. The average Indian girl nearing twenty is much slighter than the average American girl, and weights of 85 and 90 lb. are common. The diet was studied during a 7-day period and the following average daily figures were obtained: protein 63.2 gm., fat 33.6 gm., carbohydrate 351.5 gm., calcium .462 gm., phosphorus 1.34 gm., iron 30.97 mg., vitamin A 994 I.U., thiamin 767 I.U., ascorbic acid 25.8 mg., calories 1963.

BRIEF HISTORICAL NOTES ON MEAD'S CEREAL, PABLUM AND PABENA

HAND in hand with pediatric progress, the introduction of Mead's Cereal in 1930 marked a new concept in the function of cereals in the child's dietary. For 150 years before that, since the days of "pap" and "panada," there had been no noteworthy improvement in the nutritive quality of cereals for infant feeding. Cereals were fed principally for their carbohydrate content.

The formula of Mead's Cereal was designed to supplement the baby's diet in minerals and vitamins, especially iron and thiamine. How well it has succeeded in these functions may be seen from two examples:

(1) As little as one-sixth ounce of Mead's Cereal* supplies over 50% of the iron and 20% of the thiamine minimum requirements of the 3-months-old infant. (2) One-half ounce of Mead's Cereal furnishes all of the iron and 60% of the thiamine minimum requirements of the 6-months-old baby.

That the medical profession has recognized the importance of this contribution is indicated by the fact that cereal is now routinely included in the infant's diet as early as the third or fourth month instead of at the sixth to twelfth month as was the custom only a decade or two ago.

In 1933 Mead Johnson & Company went a step further, improving the Mead's Cereal mixture by a special process of cooking, which rendered it easily tolerated by the infant and at the same time did away with the need for prolonged cereal cooking in the home. The result is Pablum, an original product which offers all of the nutritional qualities of Mead's Cereal, plus the convenience of thorough scientific cooking.

During the last twelve years, these products have been used in a great deal of clinical investigation of various aspects of nutrition, which have been reported in the scientific literature.

Many physicians recognize the pioneer efforts on the part of Mead Johnson & Company by specifying Mead's Cereal and PABLUM—and also the new Pablum-like oatmeal cereal known as PABENA.

*Pablum, the precooked form of Mead's Cereal, has practically the same composition: wheatmeal (farina), oatmeal, cornmeal, wheat embryo, beef bone, brewers yeast, alfalfa leaf, sodium chloride, and reduced iron.

News Notes

Canadian Dietetic Association. According to a letter received from Dorothy McNaughton, President, the Canadian Dietetic Association has established a headquarters office at 78 Grosvenor St., Toronto 5, Ontario, Canada, with Joan E. Brown as Office Secretary.

The annual meeting of the Canadian Dietetic Association will be held at the Royal York Hotel, Toronto, June 10-12, 1946.

A list of universities giving courses approved by the association and a list of approved postgraduate courses sponsored by the association are on file in the headquarters office of the American Dietetic Association in Chicago.

Publications Needed for Library in Philippines. The following letter has been received from José S. Camus, Under Secretary of the Department of Agriculture and Commerce, Manila: "At the outbreak of World War II, the Scientific Library of the Bureau of Science, an office under this Department, housed one of the largest and best known collections of technical and scientific publications in this part of the Orient. This same library is no more. It was totally destroyed by the Japanese during the war. We shall appreciate it, therefore, if you will kindly help us in the gigantic task of building anew from scratch some such collection by donating to the library a set of your available publications addressed to the Scientific Library, Bureau of Science, Manila, Philippines." Gladys E. Hall, Executive Secretary of the American Dietetic Association, has written to Mr. Camus, promising the cooperation of the Association in helping to build up the collection of publications in the library in Manila.

International Federation of Business and Professional Women's Clubs. The American Dietetic Association was represented at an international conference held under the auspices of the National Federation of Business and Professional Women's Clubs in New York, January 19–21, by E. Alliene Mosso, St. Luke's Hospital. Twenty countries were represented at the conference, the purpose of which was to explore the problems of women in the postwar world. Particular attention was given to the participation of women in public life, the economic opportunities of women, and their responsibility in international affairs.

Income and Food Buying. How the farmer's bread and butter is affected by the earnings of city workers is shown by USDA studies of consumer food purchases and their relation to incomes, summarized in *Food and Home Notes*, February 6. The studies show that the demand for farm products rises as the incomes of city people rise—that more pounds of food are bought and more money is spent for food as incomes are larger. Higher-income families purchase not only larger quantities of food but also more expensive and nutritious foods. For example, surveys of family buying made in 1935–36 throughout the country show that families on yearly incomes of less than $500 purchased an average of only 1000 lb. food per person, and spent an average of only about $60 per person. Those on incomes of $1,000 to $2,000 bought 1400 lb. food and averaged $150. But when incomes reached $5,000 or over, the average per person was well over 2000 lb. food and almost $400 was spent.

Adequate Diet. This is the title of a leaflet based on a local diet therapy project for 1945, directed by the Diet Therapy Committee, Rochester (Minnesota) Dietetic Association, headed by Florence C. Schmidt. It was submitted to the state dietetic association and carries its endorsement. Since the first of the year the booklet has been used in Rochester. "It is proving to be helpful in general, adequate dietary teaching, as well as being used to advantage in the school system," according to Ruth Nickel, president, Minnesota Dietetic Association.

Food Standards, Grades and Labels. A public meeting to consider the question of the issuance of permissive U. S. Consumer Standards for Irish potatoes was held before the USDA in Washington, February 28. U. S. Standards have been used for many years by growers, shippers, and receivers as a basis for wholesale trading, but most fresh fruits and vegetables lose their identity by grade before they are offered for sale to consumers in retail stores. Potatoes are an exception as considerable quantities are offered for sale in retail stores already packed and labeled with wholesale grade designations. Potatoes so packed and graded have been the subject of consumer criticism, however, principally because of size. The standards proposed for consideration at the meeting were not materially different from existing official wholesale grades, except for size and reduced tolerances. Grade names, under the proposed standards, would be alphabetical instead of numerical, and the size classification would become part of the grade designation.

In addressing the National Association of Frozen Food Packers at their annual convention, February 6, Edwin T. Gibson, vice-president of General Foods Corp., New York, stated that quality control must be adopted voluntarily by the frozen food industry or be forced upon it. "It is up to us," he told packers, "individually as manufacturers and collectively as vending members of a progressive new industry to push quality control to the highest point of efficiency in our own organizations."

National Food Situation. Many people in the United States still do not get enough of the foods that make for nutritionally adequate diets, according to studies made in the BHNHE and reported in a release from USDA, February 5. Families with very low incomes may be short of calories as well as the important minerals and vitamins. Many families of all income groups consume smaller quantities of the protective foods than they need. The need for higher level consumption of milk, vegetables, and fruits is especially marked.

The Bureau estimates that if everyone in the United States were to follow its moderate-cost food plan, at least 20% more milk would be needed this year than was consumed in 1945, at least 10 to 20% more citrus fruit and tomatoes, and at least 25% more green and yellow vegetables. At price levels prevalent late in 1945, the weekly cost of food for a family of four probably would be about $12 to $14 by

Sunway BEVERAGE BASE

fortified with Vitamin B_1 and C

available in Orange, Lemon and Lime Flavors

12-Oz. Can Makes 4 Gallons of Beverage

This can when packed contained 7.69 GMS. of VITAMIN C (Ascorbic Acid) and .0649 GMS. VITAMIN B_1 (Thiamine Hydrochloride).

The FINISHED BEVERAGE, made according to directions on label, will contain 120 MGS. VITAMIN C, 1.0 MG. of VITAMIN B_1 and 116.3 CALORIES, TO EACH 8-OZ. GLASS.

This provides 100 and 400 per cent respectively of the adult minimum daily requirements for VITAMINS B_1 and C.

19 OUNCES of FRESH NATURAL, tree-ripened FRUIT JUICE was used in the making of this 12-ounce can of DEHYDRATED SUNWAY BEVERAGE BASE.

Sunway Beverage Base makes it possible to supply nutritious beverage juices at a moment's notice in hospitals, institutions, etc. A beverage base that furnishes high nutritional values of citrus juices and of ascorbic acid and thiamine hydrochloride . . . at a minimum of expense.

These delicious new dehydrated fruit juice flavors are developed by a new and exclusive process and are ***Easy to Prepare*** — just add water and sweeten.

So Economical to Use—One 12-ounce can of SUNWAY BEVERAGE BASE makes 4-gallons of true fruit beverage, and costs only $1.50. Cost of 8-oz. glass of "Sunway", including sugar is approximately 2½ cents.

★

If you have not tried SUNWAY BEVERAGE BASE, send for details today.

Sunway Beverage Base has been accepted by the Council on Foods and Nutrition of the American Medical Association.

SUNWAY Fruit Products

CHICAGO 11, ILLINOIS

the low-cost plan and about $16 to $18 by the moderate-cost plan, according to this report.

The January issue of USDA's *National Food Situation* includes a summary, approved by the Outlook and Situation Board, which states that civilian per capita food consumption in the United States in 1946 is expected to be at least as large and may even exceed that of any previous year. This is in sharp contrast with the situation outside the United States, with per capita world supplies for 1945–46 averaging about 12% below prewar levels. Total food supplies of the United States in 1946 for domestic consumption, military use, and export are not expected to differ greatly from 1945. Despite some increase in exports to meet the critical needs of liberated areas, civilian consumption in the United States probably will be larger than last year. Civilian food supplies in the aggregate will be hardly sufficient to satisfy total domestic demand. Most prominent among the foods that will be short throughout the year are sugar and butter. Civilian supplies of meat, canned fish, fats, and canned fruits are expected to be insufficient to satisfy consumer demand in full at present prices during a large part of the year. The quantities of corn products and rice marketed in 1946 are expected to be smaller than in 1945. Among the foods for which consumption per person is expected to be higher than in 1945 are beef, pork, fish, evaporated milk, cheese, fluid cream, lard, processed fruits and vegetables, and potatoes. A little more sugar may be available than last year. The nutritive value of the 1946 per capita food supply is expected to be about the same as in 1945. This level is considerably higher in all nutrients than in the prewar years. An average of about 3360 calories per person per day is expected for 1946 compared with 3250 in 1935–39. The effect of the recently announced wheat conservation program is to enhance slightly the protein, iron and B vitamin, especially thiamin, content of the average diet. One of the charts in this issue shows changes in civilian per capita consumption of major foods, 1941–45, and preliminary indications for 1946. Another shows nutrients available for civilian consumption per capita per day, calendar years, 1935–39 average, 1943, 1944, 1945, and forecast for 1946 with percentage comparisons, from data computed by BHNHE.

One prewar import unlikely to return in prewar volume to grocer's shelves in this country is the dried Zante currant from Greece, according to USDA. The United States now produces more than enough for its needs, and war damage, neglect, insects and disease have reduced Greek currant production to less than half, according to *Food and Home Notes*.

The scarcity and high price of vanilla beans which favored the sale of imitation vanilla during the war may continue to have their effect on the use of the natural extract in the future, according to the Office of Foreign Agricultural Relations, USDA. The manufacture of vanillin, an essential ingredient in imitation vanilla, greatly increased in spite of wartime difficulties. Manufacturers of quality ice cream and confectionery are the best customers for "pure" vanilla extract.

Sweet Potatoes. To get the most vitamin A in sweet potatoes, choose the deep-colored varieties that are rich in carotene, scientists of the North Carolina Experiment Station advise. Recent tests at this station show that the red- or yellow-fleshed varieties are remarkably good sources of vitamin A, but that the pale-fleshed kinds provide very little. Four deep-colored varieties tested proved to be more than 5 times as rich in carotene as 8 light-colored varieties. Sweet potato varieties differ much less in vitamin C than in vitamin A.

World Food Situation. Reduction in 1945 of total world food production by 12% per capita below prewar levels, concentration of this reduction chiefly in countries normally dependent on imports, and disruption of distribution in war-torn nations, are the chief causes of the present grave world food problem, according to a USDA report prepared by the Office of Foreign Agricultural Relations. The report, *World Food Situation—1946*, covers in detail about 65 countries and shows in addition the supplies of the world's major food products that move in international trade. The data and conclusions are based on information from agricultural attachés and other foreign service officers of the United States stationed abroad, reports of foreign governments and U. S. occupation authorities, and background information in the files of USDA.

The United States and Canada, British Isles and the Middle East are cited as the only large areas where food production in 1945 was relatively favorable. "Despite a much larger than usual flow of food from the surplus to the deficit food producing areas," the report continues, "there remains wide variation in the quantities of food available for consumption in the different countries. Food shortages are likely to be most seriously felt in the first six months of 1946, with rations in several countries near starvation levels." In continental Europe, only Denmark and Sweden at present have diets approximating prewar levels. Greece, France, Czechoslovakia, Switzerland, Norway, the Netherlands, Luxembourg, and Belgium, which at the end of 1945 had a tolerable standard of between 2100 and 2500 calories daily for the nonfarm population, face a decline in this restricted level during the first half of 1946. A third group, including Spain, Italy, Germany, Austria, Finland, and segments of Poland, Hungary, Yugoslavia, and Rumania, with perhaps only two thirds of their prewar per capita intake, are sorely deficient in regard to total energy and almost every nutrient. The effects of malnutrition, hunger, and even starvation in this group are apparent and may become aggravated before the new harvest is in.

While world production will undoubtedly increase in 1946–47, unless another unfavorable season is experienced over large areas, says the report, it is certain that production will still be somewhat below prewar levels, especially on a per capita basis if expansion in population is considered.

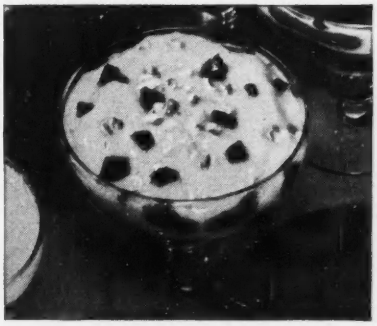
In continental Europe, which normally imports about 10% of its food, the report points out that production in the 1945–46 season is 25% below prewar levels, due chiefly to disruption by war and to severe drought in the Mediterranean area extending through southern and southeastern Europe and North Africa. Unfavorable growing conditions are also cited for several southern hemisphere countries and other areas including Japan.

USDA announced February 11 that 3000 metric tons of soybean oil will be allocated for export to Greece as a result of assurances received from the Greek Government that export permits will be granted for an equal quantity of olive oil for importation into the United States.

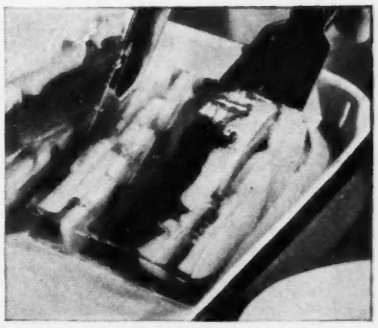
World production of citrus fruits in 1945–46 is the largest on record, according to USDA's Office of Foreign Agricultural Relations. The citrus output in 36 major producing countries in 1945–46 is estimated at 335 million boxes, compared with 320 million the year before, and an average of 266 million in the 1935–39 period. Of the current season's prospective citrus production, 243 million boxes are oranges, tangerines and mandarins, 66 million boxes are grapefruit, and 26 million boxes are lemons. Orange production, reaching a record high level, exceeded the prewar average of 208 million boxes by 17%, with output continuing to expand in the United States, Mexico, French Morocco and the Union of South Africa. The North American, Central American and West Indian production for 1945–46 is forecast at 121 million boxes, which is a million less than the previous year, but 61% more than the prewar average. World production of lemons has remained fairly constant for several years at

What beautiful ways to save time, money, and sugar!

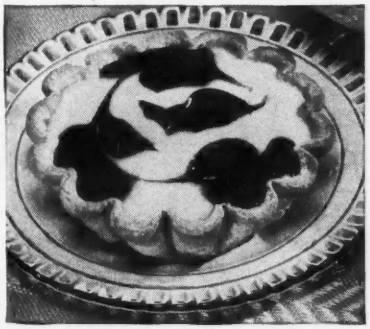
Rainbow Parfait—layers of Strawberry, Lemon, and Lime Jell-O flakes, alternated with whipped cream or Jell-O Vanilla Pudding. Each flavor keeps its full richness, thanks to Jell-O's "locked-in" process.



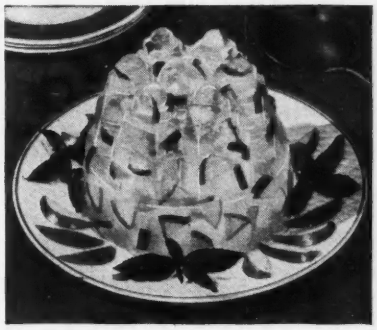
Date-Nut Butterscotch Pudding—crunchy nuts and chopped dates in rich Jell-O Butterscotch Pudding. This Jell-O favorite has the real brown-sugar taste, yet takes none of *your* sugar to make!



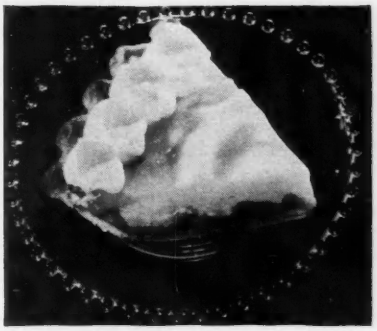
Gold-and-White—one of the self-layering Jell-O molds. Just add bananas and peaches to Orange Jell-O, and presto—peaches sink to bottom, bananas stay on top! Jell-O sets fast, too!



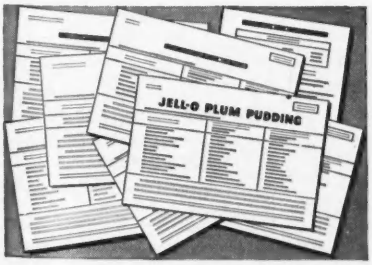
Marble Tart Filling—made by alternating spoonfuls of creamy Vanilla Pudding with rich Chocolate Pudding. *All* Jell-O Puddings have an old-fashioned taste—cost about two cents a portion (including the milk).



New Manhattan Salad—a tempting combination of Lemon Jell-O, apples, pecans, and celery. Jell-O is a good—and inexpensive—way to stretch salad or leftover ingredients.



Lemon Pie, home-style. Get that tangy, homemade flavor the easy way—from Jell-O Lemon Pie Filling, made with the juice of *real lemons*. Costs so little, makes such delicious pies, puddings, and sponge desserts.



300 quantity recipes, free! Mail the coupon at the right for the GF Quantity Recipe Service. This service includes directions for the dishes on this page, as well as hundreds of other tested quantity recipes. New ones are constantly added.

WHAT ARE YOUR FOOD PROBLEMS?

Your GF man knows all the latest angles on shortages, substitutes, quantity food problems. Consult him when he calls.

Jell-O & Jell-O Puddings

PRODUCTS OF GENERAL FOODS

FREE! GENERAL FOODS, INSTITUTION DEPT. A.D.A. 4-46
Battle Creek, Michigan

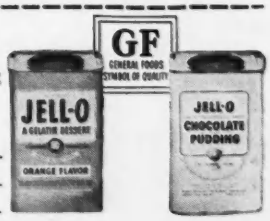
☐ Please send me complete QUANTITY RECIPE SERVICE of tested recipes.

☐ Please send me your free JELL-O recipes.

Name_____

Institution_____

City_____ State_____



around 25 million boxes. The output for 1945–46 outside the United States decreased 20%, but rose 45% in this country. Nearly all the world's grapefruit is grown in the United States.

World meat output in 1945, excluding Asia and relatively unimportant countries in Africa and Latin America, totaled about 59.3 billion pounds, according to a USDA report, representing a drop of 6.8 billion pounds from 1944 and of 6.5 billion pounds from the prewar average. The reduced output in 1945 reflects the war losses of livestock in European areas; declining feed supplies in many countries; unfavorable pasture conditions, especially in the southern hemisphere; and in the case of pork production, less favorable feed-hog ratios at the time of breeding. North America's production is placed at 26 billion pounds against 28.3 billion in 1944 and the prewar average of 18.6 billion. Preliminary estimates show that 1945 meat production in Europe, excluding the Soviet Union, amounted to only about 57% of the prewar figure; in the United Kingdom, 75% of the 1934–38 average.

"Know Your Public Health Nurse" Week. An educational campaign to make the nation better acquainted with public health nursing services is being sponsored April 7–13 by the National Organization for Public Health Nursing in cooperation with the U. S. Public Health Service, according to a release from the National Organization for Public Health Nursing, 1790 Broadway, New York 19. In endorsing the campaign, Thomas Parran, Surgeon General, U. S. Public Health Service, states, "America today faces a healthier future as a result of the great strides made in this field of medical service during World War II. But this added medical knowledge can be used advantageously only if prevention, as well as cure, receives its proper emphasis. For this reason the observance of "Know Your Public Health Nurse Week" takes on added significance at this time. Public health nurses play an important part in the prevention of disease, the control of epidemics, the early detection of remediable defects, and the adoption of good health habits by school children and adults."

Modern Meat Methods Programs. A nationwide program, conducted by the National Live Stock and Meat Board, especially designed for the benefit of restaurants, hotels, clubs, hospitals, school lunchrooms and other public eating establishments, was launched in Chicago the week of February 11, with more than 1000 persons of the food service field attending. The same program subsequently was conducted in New York and Washington, and will be repeated in many other large cities from coast to coast in the next few months. The primary purpose of this educational campaign is to assist purveyors of meals in utilizing the available meat supplies to the best possible advantage, according to a release from R. C. Pollock, general manager.

The subject matter presented is wide in scope. Modern methods of cooking meat are shown. Use of the less-demanded meat cuts is explained. Ways of stretching available meat supplies are brought out. Judging meat for quality, proper trimming of meat cuts before cooking, and other topics are covered. A high light of the program is a demonstration showing the value of cooking meat at low temperature.

Some 25 national food service organizations are lending their support to this activity, according to the release, including the National Restaurant Association, American Dietetic Association, American Hotel Association, Air Transport Association of America, and others. A list of the cities to be covered in the spring months is available from the National Live Stock and Meat Board, 407 S. Dearborn St., Chicago 5.

Candy Makes the Congressional Record. A severe attack on candy appeared in the *Congressional Record* in January, according to *Food Field Reporter* February 18. The report was prepared for the New Hampshire Boards of Health and Education and forwarded to the general public by Senator Tobey through the *Congressional Record.*

Nutritional Value of 80% Flour. According to a release from USDA, February 8, if present levels of enrichment of flour are maintained, the new 80% extraction wheat flour recently ordered by President Truman will have the same values for thiamin, riboflavin and niacin and for iron as the enriched white flour, and in addition, the protein quality will be improved. The 80% flour, unenriched, does not have as much thiamin, riboflavin, niacin, and iron as the present enriched white flour. Since only about 65% of the flour and flour products have been enriched, substituting the new flour for the old in all products will markedly improve the thiamin content of the remaining 35%. The 80% extraction wheat flour unenriched has about 40% as much thiamin as whole wheat flour, one half as much riboflavin and iron, and one fourth as much niacin as the whole wheat.

British flour has called for 85% extraction during most of the war years. Calcium was added to this flour, but no need for this is anticipated in the United States where supplies of milk and milk products and green vegetables are so plentiful.

The new flour will have a slightly darker color and a more "wheaty" flavor which will appeal to many people who are interested in better eating. It is expected that the use of the new flour and bread by homemakers in this country will constitute a very large contribution toward relieving suffering and hunger in the rest of the world.

When United States flour mills began milling flour containing 80% of the wheat on March 1, this country still had a lower milling percentage than most of the rest of the world, according to USDA. In practically all of Europe and Russia, wheat flour extraction rates for bread are 85 to 90%, according to reports received by the Office of Foreign Agricultural Relations. In a few countries, the rate is higher; South Africa, for instance, has a rate of 96% for the past 4 years, and for corn, 100%. In addition to the higher extraction rate, in many countries there are considerable quantities of rye and coarse grains such as corn and barley added to the flour.

Above-normal purchases of flour for household use are unnecessary and unwise, USDA warned in a release dated February 1, asking housewives not to hoard supplies. Excess purchases are unnecessary because there is no shortage of flour in this country, and flour may spoil in home storage. Flour kept at the usual room temperature may become infested with weevils. Nor will it keep successfully in the home refrigerator, because flour takes up moisture. It must be kept dry as well as cool. Both wheat and flour are desperately needed by the hungry peoples of Europe and other countries, according to this release, and it would be a great tragedy if flour were allowed to spoil in this hour of need.

Foods—Enriched, Restored, Fortified. This is the title of a 16-page leaflet just issued by the BHNHE, USDA. Enriched bread and flour, fortified and restored cereals, fortified oleomargarine, vitamin D milk, and iodized salt are the foods covered. The bulletin went to press before the President's program calling for national production of 80% extraction flour. Since War Food Order No. 1 requiring enrichment of all white bread and rolls is still in effect, the bread made by commercial bakers from 80% extraction flour will be enriched to the level required by that order. Enrichment of flour is voluntary, but many millers will undoubtedly continue their same enrichment practice for flour sold in the retail trade.

The booklet is designed for use by nutrition committee chairmen, home demonstration leaders, teachers, and others working with groups interested in nutrition study. Free

a Jolly Good way to start the day!

this whole-hearted breakfast of wholesome whole wheat

Here's a breakfast can't be beat—it's Nabisco Shredded Wheat! All the golden-good, natural flavor . . all the nutritious full-body of the choice wheat, just steamed, shredded, baked! Nabisco Shredded Wheat's the one cereal that tastes good cold or hot! And every bit as nourishing as a big bowl of cooked cereal!

Be sure you get Nabisco Shredded Wheat—the original Niagara Falls product It's a natural for a perfect breakfast!

Delicious, ready to serve . . .
yet as nourishing as a hot cereal

single copies may be obtained from the Office of Information, USDA, Washington 25. Prices for copies in quantity may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25.

Bread Made With New Flour. The first loaves of bread made from the new 80% extraction flour in the baking laboratory of USDA proved an agreeable surprise, according to *Food and Home Notes*. The bread, made under commercial baking conditions, had a slightly off-white or creamy cast but actually differed little in appearance from the loaf made with standard white enriched flour. Many of the tasters could detect no difference in flavor or texture; others thought the new bread had a slightly more "wheaty" flavor. There was no noticeable difference between bread made with the bleached and unbleached flour.

Food Value Charts. A revised set of 12 food value charts has been prepared by the Philadelphia Child Health Society, 311 S. Juniper St., Rm. 609, Philadelphia 7, with the cooperation of nutritionists in Philadelphia and of the Division of Nutrition, Bureau of Maternal and Child Health, Pennsylvania Department of Health. Revision was delayed until the release in December 1945 of the *Tables of Food Composition in Terms of Eleven Nutrients* prepared by BHNHE, in cooperation with the National Research Council. At the request of many nutritionists, physicians, and public health nurses working in maternal and child health centers, a chart indicating vitamin C in fruit juices has been substituted for one in the previous set on vitamin B_1 in cereals. The charts emphasize foods relatively low in cost and commonly available in most parts of the country. Simplicity of presentation on the face of the chart has been the chief objective; only relative contributions of average servings are shown. Precise figures as to amount and weight of servings and nutritive content are given on the reverse of the charts. The N.R.C. Recommended Dietary Allowances, revised August 1945, are also recorded on the back of each chart. The set of 12 charts is priced at 50 cents.

Floating Fish "Factories". The January issue of *Quick Frozen Foods* draws attention to "floating fish factories" which have been suggested as a practical means of overcoming the drawbacks which have handicapped the fish industry to date. All the necessary processes can be performed on board the fishing trawlers where the fish can be quick frozen, thus ensuring highest quality in the final product. Fish freezers will be able to handle two to three times as much filleted fish in the same space now devoted to fish frozen "in the round." The acting chief of the Market Development Section, USDA, states that per capita consumption of fishery products will increase in the future because of the enthusiastic acceptance of frozen foods. When additional freezing plants are built near fishery production areas, it will become possible to handle glut runs of certain species of fish, such as whiting, and thereby prevent the needless loss of thousands of pounds of high quality foods. Among seafoods now being frozen are shrimps and prawns, crabmeat, crabs, lobster, lobster tails, crawfish tails, oysters and clams. Fifty per cent of Louisiana shrimp is quick frozen at present.

Canned Fish. Barbara Daly Anderson, director of the consumer service bureau, *Parent's Magazine*, and a member of the A. D. A., addressed the fish canners at the National Canners Association meeting in Atlantic City recently on the subject, "Why I Don't Serve Canned Fish More Often," according to a report in *Food Field Reporter*. A questionnaire sent to 1200 women disclosed that only 10% serve canned fish more frequently now than they did before the war. The total consumption of fish, fresh and canned, has dropped from an average of 12.8 lb. per person in the years 1935 to 1939 to an average of 10.9 lb. in 1945, Mrs. Anderson said.

When asked why they did not serve canned fish more often, 43% of the consumers reported that at least one member of each family disliked it; in the majority of cases, the husband. Many complained of the limited ways of serving canned seafoods, and asked that more recipes be made available. Only 20% could recall, with any accuracy, attractive advertisements of canned fish. Suggested improvements made by home economists as to the quality of the product itself include the use of different or better refined oils in packing fish, removal of bones from crabmeat and salmon, and the removal of the vein from shrimp. Recommendations made by Mrs. Anderson as a result of the survey and the sampling of food experts' opinions are: more recipes and menus—on labels, in recipe booklets, and in advertising; more dramatic advertising; education of the consumer with regard to the economic value of fish as a protein food; education in the proper handling of fish—after the can is opened; improvement in the quality of the pack—less watery packs, milder flavored oils, and the removal of extraneous viscera.

Frozen Cream. Cream that has been frozen tends to lose its smooth body when it thaws and the fat tends to rise and form a more concentrated cream layer on the surface. This shows up plainly in glistening oil droplets when frozen cream is used in coffee, for example. Why this happens is a question of considerable commercial importance now being studied by dairy scientists of USDA, according to a release dated February 13. Except for this characteristic, frozen heavy cream for whipping might sell in retail-size packages like other frozen foods. Dairy scientists have found so far that cream with very small fat globules, such as Holstein cream, deteriorates least in thawing; that the temperature of the milk and of the cream after separating should be kept warmer than 70°F. until the cream is frozen; and that fast freezing helps preserve the emulsion.

Aging Steaks. Aging is only part of the story of producing tender, delicious "aged" beefsteaks, says K. F. Warner, extension meat specialist of USDA, quoted in *Food and Home Notes*, February 13. Steaks for long aging must come from properly mature and very well fattened animals. Only ribs and loins of beef can be aged long because they are the only parts of the animal in which the lean is covered with enough fat to protect it from mold. The growth of mold is watched carefully during the aging to be sure it does not penetrate through the fat or into the bone, which would give the meat a moldy flavor. The meat is aged in special coolers where temperature and humidity are controlled and where air currents are directed to prevent condensation of moisture on the meat. Finally, after aging, the meat is carefully trimmed to remove surface mold before being cut and cooked. Without these precautions, long aging results in meat with a moldy, rancid, stale or old flavor.

First Lt. Helen A. Tremback Honored. According to an announcement received from the Office of the Surgeon General, Lieutenant Tremback has been cited "for meritorious service in connection with military operations from November 24, 1944 to December 8, 1944."

Dr. Goodhart Heads Vitamin Research, Inc. Dr. Robert S. Goodhart, since March 1943 chief of the Industrial Feeding Program Division, War Food Administration, USDA, has been named scientific director of the Institute for Vitamin Research, Inc., according to an announcement by Dr. Theodore G. Klumpp, chairman of the institute's board of governors. The purpose of the institute is to maintain

There are two sides to this picture!

Each boy in each bed is being helped back to health by a new medical development. Each of these developments owes much, surprisingly enough, to milk — *and each does a completely different job!*

Billy, on one side, will soon be on his feet, thanks to the antibiotics. Their job is to attack infection, destroy "bugs." In short — *kill.* One of these is today's miracle-working penicillin, which is derived from a mold nourished by milk sugar.

Jimmy, on the other side, is gaining strength from a group of "builder-uppers." *Their* job is to restore tissues, replenish organs. Concisely, to *give life.* These are the aminos—basic elements of protein, furnished in abundance by milk.

Both sides of this picture illustrate a story of extensive milk research. At National Dairy plants, proteins, sugars and aminos are produced from milk and supplied for pharmaceuticals which are making great contributions to the nation's health and knowledge of nutrition.

Similar research has resulted in a brand-new kind of baby food — in a smart textile fiber—in a delicious flavoring agent. By this means, National Dairy constantly works to extend the usefulness of milk — nature's most nearly perfect food — so that it may perform an even fuller service to you.

Dedicated to the wider use and better understanding of dairy products as human food . . . as a base for the development of new products and materials . . . as a source of health and enduring progress on the farms and in the towns and cities of America.

Kraft Sealtest Breyers

NATIONAL DAIRY
PRODUCTS CORPORATION
AND AFFILIATED COMPANIES

continuing research on "problems in nutrition, particularly as they relate to vitamins, to the end that the health and welfare of mankind may be improved through better nutrition." It proposes to make grants to individuals and institutions for research, and to provide scholarships and fellowships.

Lt. Alice Claire Curley Announces Marriage. Announcement has been received of the marriage of Lt. Alice Claire Curley, M.D.D., formerly of Scranton, Pa., to Lt. John Parkinson Keyes, son of Mrs. Frances Parkinson Keyes, of Alexandria and Baton Rouge, "somewhere in Europe."

Zola Vincent Assumes New Post. Mrs. Vincent recently joined the staff of Flanley and Woodward, New York, where she will assist in the handling of public relations for the Grocery Manufacturers of America, it was reported recently in *Food Field Reporter*. Mrs. Vincent was food editor of the New York *Journal-American* during the war and served prior to that as assistant to Paul S. Willis.

Canadian News. The biennial convention of the Canadian Home Economics Association will be held July 2–5, at the Canadian Pacific Railway summer resort hotel, The Pines, Digby, Nova Scotia. A short refresher course for teachers will be offered immediately following the convention.

An invitation to members of the American Dietetic Association to attend the convention has been extended by Marjorie Bell, 22 Wellington St., Halifax, Nova Scotia, from whom detailed information may be obtained. In a communication to the JOURNAL asking that the invitation be transmitted, Miss Bell writes as follows: "The Pines is beautifully situated, with opportunity for every type of recreation close at hand, and the historical background of the country all around Digby is as fascinating as any in North America. I understand there is to be a good boat service this year from New York and Boston to St. John, Halifax and Yarmouth. Motoring up to St. John and then continuing across the Bay of Fundy makes a lovely vacation trip. After the convention one can travel on through the beautiful Annapolis Valley to the hills and coast of Cape Breton or cross by ferry to the fertile fields and sandy beaches of Prince Edward Island, or to Halifax harbour."

The Canadian Home Economics Association *Newsletter* for January contains the announcement of the publication of *Foods for the Family* by the Consumer Section, Department of Agriculture, Ottawa. This is a revision of the booklet carrying the same title which was issued in mimeographed form last year. It covers, briefly, "Planning Better Meals," "Stretching Food Dollars," "Foods We Have and How Best to Use Them," "Saving Fats and Sugar," "Cooking Hints" and "Family Meals," with a standard breakfast and 10 basic dinners and suppers or luncheons.

A *Manual of Nutrition* has been prepared by Dr. Magnus Pyke, a former member of the Scientific Adviser's Division of the Ministry of Food for the British Government. This manual is designed to give a grounding in the principles of nutrition to people who may already possess a practical knowledge of catering. Published by H. M. Stationery Office, York House, Kingsway, London, W.C. 2, England. Price 1s. net.

Katherine Middleton, former editor of the *Newsletter*, attended the F. A. O. conference in Quebec during October as correspondent for Southam newspapers. On her return, Miss Middleton, the only home economist in Canada representing the press, addressed a special meeting of the local home economics association on the F. A. O. organization. In response to Sir John Orr's request that the press delegates spread the story of F. A. O. in their respective countries, Miss Middleton is addressing groups in the Maritimes on this subject.

Kathleen L. Jeffs, formerly Wing Officer in charge of messing in the Royal Canadian Air Force, has resumed her position as dietitian at the restaurant of the T. Eaton Company, Montreal.

Margaret Clarke has been appointed supervisor of dietetic services, Department of Veterans Affairs, Ottawa, after three and one half years as Messing Officer in the R. C. A. F.

Arizona Dietetic Association. At the annual meeting attended by 15 members of the state association, one A. D. A. member from California, and 29 guests, Ann Willis Quint spoke on "A Dietitian's Experiences With the Red Cross Food Service in the Mediterranean Theater," and Fred McPherson on "Food Habits of Native South Pacific Island Groups and the Relationship of Tropical Diseases to Nutrition."

Recent changes at Phoenix hospitals include: Virginia Morrow, Raton, now assistant dietitian at St. Monica's Hospital; Eleanor Smith Coffey, Iowa City, now teaching nutrition to nurses at St. Monica's Hospital; and Vlasta Bocek Antos, now assistant dietitian at Good Samaritan Hospital.

Gertrude Blaker, formerly of University Hospital, Western Reserve Medical Center, Cleveland, is now dietitian for Sky Chef Restaurant, Sky Harbor Airport, Phoenix.

Elizabeth Jonson is at Tucson Medical Center. Anna McCuish is assisting in the dining hall at the University of Arizona and teaching institution management. Emma Gardner is a nutritionist for the Tucson chapter of the American Red Cross. Gertrude Christy is teaching school in McNary.

Ruth Read, graduate of Iowa State College, is supervisor of the dining hall at Arizona State Teachers College, Tempe.

Boyda Lacy Adair, formerly of Kansas, is doing substitute teaching in the Tucson schools. The Adairs have a small daughter, Jo Carol.

Barbara Waddell, Ontario, Canada, member of the Canadian Dietetic Association, is dietitian at the famous Jokake Inn near Phoenix. Ruth Cook, also member of the Canadian association, is home demonstration agent in Navajo and Apache Counties.

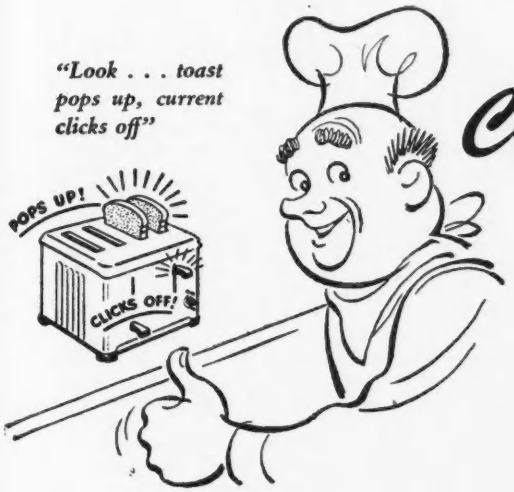
Colorado Dietetic Association. Mrs. Bessie Brooks West, President, American Dietetic Association, is scheduled as guest speaker at the meeting of the association in Denver, April 3.

Sybil Adams is now assistant therapeutic dietitian in the Children's Hospital, Denver. Veta Mae Longfellow has accepted a position as administrative dietitian at Porter Sanitarium, Denver. Mrs. Virginia Gunderson has resumed her duties at Colorado General Hospital.

Mary Ruetz, chairman of press relations for the state association, is planning to send mimeographed copies of each issue of the A. D. A. *Courier* to all members.

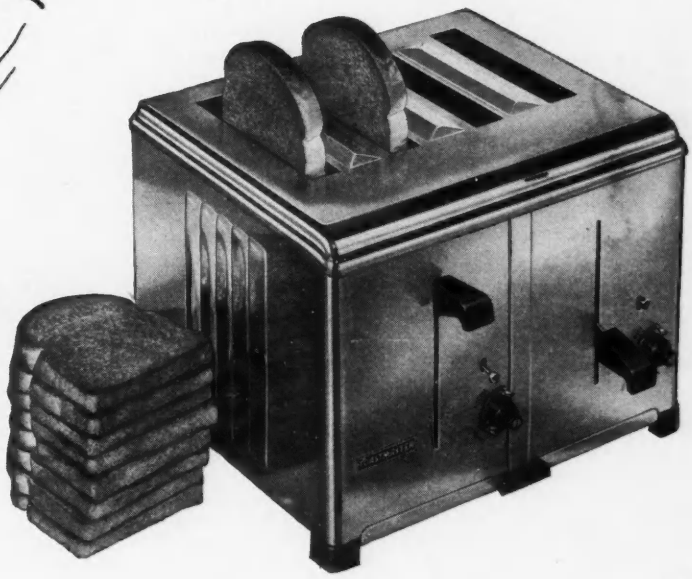
Minnesota Dietetic Association. Officers for 1945–46 are: president, Ruth Nickel, St. Mary's Hospital, Rochester; president-elect, Harriett Warmington, Veterans Hospital, Minneapolis; secretary, Jane Landy, Swedish Hospital, Minneapolis; treasurer, Elizabeth Boyer, Minneapolis General Hospital; delegate, Alice Biester, University Farm Campus, St. Paul. Chairmen of sections and committees were appointed as follows: Nominating Committee, Florence Schmidt, St. Mary's Hospital, Rochester; Membership, Miss Landy; Constitution and By-Laws, Alberta Gurtler, Division of Public Assistance, St. Paul; Bulletin, Alice Irmish, Mayo Clinic, Rochester.

Minnesota's three local organizations of dietitians include members from several cities. The Head of the Lakes Association is presided over by Louise Eich, St. Mary's Hospital, Duluth; the Rochester group, by Mildred Ska-



"Look . . . toast pops up, current clicks off"

Completely automatic...



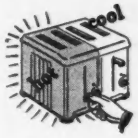
TOASTMASTER TOASTERS ARE BACK AGAIN!

TO GET yours *sooner*, order now from your food service equipment dealer. There's peak demand for the toaster that *automatically* pops slices up and clicks current off the instant toast is done to golden-brown perfection. But we're making many more "Toastmaster" toasters than ever before. So yours may be along sooner than you think. When you put it to work popping up toast profits, you'll agree that the *one* best buy in toasters—the brand with the famous "Toastmaster"* trademark—was well worth waiting for. Order yours, today!

EVERY SLICE PERFECT!

Toast is never underdone or burned. Makes the same golden-brown toast that millions get at home.

ECONOMICAL!



Uses **current only** while toasting. And *only* in the slots at work. No current waste; no preheating.

BIG CAPACITY!

"Toastmaster" toasters produce toast as fast as you want it, from 125 to 1000 slices per hour. A model to suit every volume requirement.

FLEXIBILITY, TOO!

You can add units economically, one at a time, as you need more toast. All 8, 12, or 16-slice models are composed of 4-slice units.

*"TOASTMASTER" is a registered trademark of McGraw Electric Company. Copr. 1946. TOASTMASTER PRODUCTS DIVISION, McGraw Electric Company, Elgin, Ill

TOASTMASTER Toast

The National Habit Wherever Folks Eat!

litzky, St. Mary's Hospital; the Twin Cities Association, which represents Minneapolis and St. Paul, by Mrs. Florence Nelson Fagerstrom, Minneapolis. The Rochester group met January 21. Mr. Jean Vernet, manager of the Institutional Department, George E. Hormal Company, Austin, Minn., spoke on "Industrial Cookery of the Future." Twin Cities members met at the Coffman Memorial Union, University of Minnesota, January 24. Judge Paul Jaroscek, Minneapolis, spoke on "Human Nature as Seen From the Bench," and Miss Warmington submitted a report on the October meeting of the House of Delegates.

Dr. Miriam E. Lowenberg, formerly chief nutritionist, Child Service Department, Kaiser Company, Portland, Oreg., is now nutritional supervisor of the Rochester Child Health Project. First Lt. Fern Dahlgren, former Rochester member, has returned from the South Pacific area where she served with Colonel Priestley's unit. Lt. Grace Erickson, who had been stationed at Saipan and Tinian, stopped in Rochester en route to Ft. Sheridan for reassignment. Angeline Mannick, formerly Medical Department Dietitian in North Africa and Italy with University Base Hospital 26, has returned to her duties as dietitian at the University Hospital, Minneapolis.

Ohio Dietetic Association. The largest American Dietetic Association convention in history is predicted for October in Cincinnati. Mrs. Marjorie Hall Siler and Eleanor Maclay, co-chairmen of local arrangements, already have local committees completely organized and working. Meetings have been held with national officers in charge. Visitors to Cincinnati to make preliminary plans have been the following: Gladys E. Hall, executive secretary; Mildred Egeberg, advertising manager; Mrs. Ruth Bolt Benson, former office manager; and Edith Barber, national publicity chairman.

The Community Education Committee of the Cincinnati Dietetic Association cooperated with the Nutrition Council of the Public Health Federation in staging a better breakfast week. "A Good Breakfast for a Good Morning" was the theme of this campaign. Each radio station carried programs built around the theme; newspapers ran food photographs and articles on the subject. Special programs, posters, and classwork emphasized the importance of breakfast in schools. Streetcars carried signs showing a good breakfast and store window displays tied in with the theme.

Dr. L. H. Newburgh, Department of Internal Medicine, University Hospitals, Ann Arbor, Mich., spoke on "The Dietary Treatment of Nephritis" at a meeting of the Cincinnati Dietetic Association, March 4.

At their February meeting Cincinnati dietitians heard Dr. Richard Vilter, assistant professor of medicine and assistant dean of the University of Cincinnati Medical College, give a very excellent talk, with slides, on "Deficiency Diseases as Seen by a Physician." Many of the patients shown were chronic alcoholics with associated acne rosacea, erythema and edema of the legs, ascites, purpura, conjunctivitis, keratitis, pellagrous dermatitis, glossitis, cheilosis, splinter hemorrhages in the nailbeds. Dr. Vilter stated, however, that only the hemorrhaging of scurvy is specific as a sign of vitamin deficiency. Cheilosis can be caus d by poorly-fitting false teeth. Gingival lesions may be caused by drug therapy for epilepsy. In addition to his discussion of deficiency diseases, Dr. Vilter mentioned other advances in nutrition: namely, the treatment of pernicious anemia patients with folic acid; and of those with chronic liver disease with methionine and choline. He explained the role of anti-metabolites in competing for enzymes.

Doris Williams, recently returned from duty at Anchorage Hospital, Alaska, told of her experiences before a recent meeting of the Akron Dietetic Association. On exhibit were articles of clothing and Alaskan equipment used at the Station Hospital there. Only forty miles away from the base was the famous Mantanuska Valley project, which meant that the hospital was able to have fresh milk, fresh root vegetables, eggs, and berries. Miss Williams is now a member of the staff at City Hospital, Akron.

Members of the Cleveland Dietetic Association heard the Hon. Frances P. Bolton, member of Congress, tell of her recent trip through Russia and the Near East with a group from the House Foreign Affairs Committee. She stressed our responsibility in stretching food, saving waste, and in seeing that Europe and Asia get the help they need. She suggested that we do less talking about democracy and future promises of help, that instead we give now of our leadership, food, clothing, and finance, for a starving and half-starving population is a hot-bed for revolt. "Now is the time to aid them," she said, "If they get along without us now, the opportunity for leadership and cooperation will be lost. We must keep ourselves informed and notify our congressmen of our wishes on different issues in order to keep our government truly democratic."

Members recently added to the staff of Cincinnati General Hospital are: Mary Patricia Ford, milk laboratory dietitian; and Lois Denny, diet kitchen dietitian. Both were formerly at City Hospital, Indianapolis. Mrs. Adelaide Lloyd, main kitchen dietitian, Cincinnati General Hospital, has resigned to join her husband who recently returned from overseas duty.

Recent appointments to the staff at the University Hospitals, Cleveland, are: Mary Ellen Ruple, relief dietitian in Hanna House; Elizabeth Persing, assistant in the main kitchen; Marjorie Hazlett, dietitian in MacDonald House; Mrs. Martha McLaughlin, assistant in MacDonald House.

Lt. Aura D. Louhi, M.D.D., formerly stationed at Regional Hospital, Patterson Field, has returned to her home in Ashby, Mass., for her terminal leave. Lt. Rosemary Hopkins, M.D.D., formerly at the same hospital, is now at her home in Madison, Wis. Lt. Esther Nelson, M.D.D., formerly at Huron Road Hospital, is on terminal leave at her home in Cleveland.

Recent marriages include that of Betty Fay Fry, instructor in Nutrition and Dietetics, Frances Payne Bolton School of Nursing, to Mr. Glen Hester, December 25.

Two dietitians have been added to the staff of Toledo Hospital: Margaret Baker who took her internship at Mt. Sinai Hospital, Philadelphia, and comes to Toledo from Salina, Kans., where she served with the Salina Welfare Department; and Marcena Rhoten, graduate of Ohio State University, who also interned at Mt. Sinai Hospital.

The National Dairy Council has recently opened an office in Toledo. Harriett Wolfe, formerly associated with the Dayton Power and Light Company, is director of the educational program.

Oregon Dietetic Association. The first meeting of 1946 was held January 9 at Berg's Chalet, Portland. Following the dinner a short business meeting was held and projects for the coming year were discussed. Plans were made for raising funds to provide for sending delegates to the national convention. Committee chairman appointments are as follows: Community Nutrition, Ruth Beckman, Hahnemann Hospital; Diet Therapy, Mary Alice Richardson, Good Samaritan Hospital; Food Administration, Helen Price, State University Tuberculosis Hospital; Professional Education, Mathilde Grunow, Multnomah County Hospital; program chairman, Betty Jones, St. Vincent's Hospital; press correspondent, Julia Minsinger, Emanuel Hospital.

Frances Berry, formerly of Good Samaritan Hospital, where she worked for the past year in the metabolic office, is now holding a teaching position at the University of Oklahoma Hospitals. Before working at the Good Samaritan Hospital, Miss Berry was clinical and teaching dietitian at Multnomah County Hospital, Portland.